B SHIFTER

Spring 2012

Volume 2, Issue 2

The Hazard-Zone Quarterly

B SHIFTER

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SPRING 2012

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Photo courtesy Sean Stuchen/www.seanstuchen.com

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★ Blue Star Items Complement & Support the Blue Card Hazard-Zone Incident Command Training & Certification Program.

It's Getting Hotter

Bruno discusses heat-release rates, rockets & our new leadership simulations.

BY ALAN V. BRUNACINI

Welcome to the Spring 2012 issue of B Shifter—our biggest yet. This quarter's publication really offers something for everyone. We hope you learn something new with each flip of the page—I know I do. Take for example the "How Hot is Hot" feature on pg. 36. Dan Madrzykowski of NIST shares his insights on heat-release rates, and even though it's pretty scientific stuff, Dan makes it easy to read. There's a great deal of important information in this article about the tremendous energy generated by modern contents fires and what that means to us when performing size-up or making on-scene decisions. Anyone operating in or managing a hazard zone should pay close attention to this information.

For you space geeks out there, we offer "Fire's Final Frontier," pg. 30. Mark Farias, a real nice fire chief from the Vandenberg Air Force Base Fire Department, wrote a great article about how his department manages their hazard zone. They face a unique set of response and training challenges—I doubt very many of us have actual rockets in our first-due area—but they handle them with great savvy. We are very proud these good folks are members of the Blue Card family and have their own Command Training Center. This article serves as gentle reminder to appreciate our military fire departments; they keep on ticking even when many of their personnel deploy to the far reaches of the world.

One of the things I'm most excited about in this issue is our new and free leadership simulation, which you can access here or from pg. 50. We launched B Shifter to provide the fire service with some much-needed practical leadership information and training. These personnel-problem simulations are a big step in that direction.

Please don't forget to check out our reader-response columns "Be Nice" (pg. 28) and "Functional Boss Behaviors" (pg. 50). Thanks to all of you who shared your insights. I had a great time reading everyone's ideas, and I hope to see yours soon. Drop me a line at editorial@bshifter.com.

P.S. I recently got dragged even deeper into the Digital Age. I own an iPhone now—and an iPad. (Don't worry. I haven't abandoned my 3 x 5 cards.) I have enjoyed reading our past issues on my iPad, and I hope you're taking advantage of that function. BS

Fires are burning faster and hotter, releasing incredible amounts of thermal energy. Click the image above to hear Bruno discuss NIST's recent heat-release rate tests.

Click the image above to launch Big Al's video about the Vandenberg Air Force Base Fire Department.

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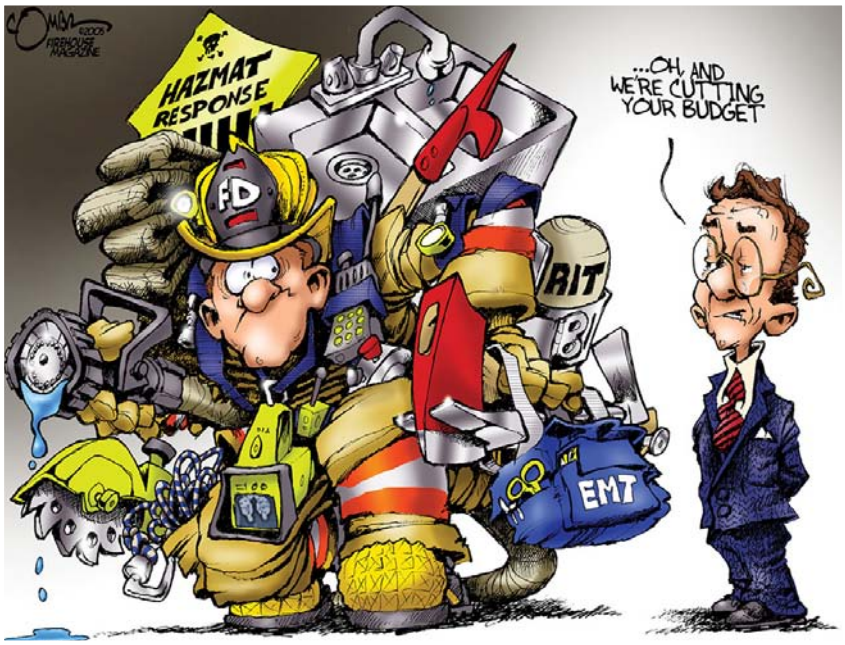
A Forward-Thinking Strategy

Want to regain political clout & the public's support? Quit whining, stop worrying & focus on the customer.

BY OTTO HUBER

Many describe what the fire service is going through as everything from a haircut to a bath to a downright gutting. Well if it's a haircut, then it's certainly compatible with a boot camp Marine's razor cut. If it's a bath, it's on par with the fire hose washdown's used on the prisoners of Alcatraz. If it's a gutting they were after, they should get a job at Seattle's famous fish market. If things continue in this direction, when they finish with us, we could end up looking like something from a terrifying slasher movie.

All across the country, fire-service leaders and organizations have been picketing city hall, marching on the state capitol and telling Mrs. Smith how unsafe she and her baby will be in the very near future due to budget cuts. Ten years ago, these efforts would have inspired Mrs. Smith and her neighbors to storm city hall and stop this assault on their public-safety services. But in recent years, when our governments announced they were cutting back, laying off, browning out and going out of business, Mrs. Smith and her neighbors have been conspicuously missing in action. As we look around the room at the council chambers in Our Town, USA, it's obvious the only folks present are our own members, their families and a few taxpayers shamed into showing up. Even then, most attendees are reluctant to step up to the microphone. After these council meetings, when you and your crew return to the firehouse, you may wonder, "What the hell just happened?" Some of your brethren might proclaim, "Mrs. Smith! How you could have forsaken us after all we have done for you? Don't you know we are your heroes?"



This well-known Paul Combs illustration, circa 2005, still rings true today. 2012's deeper budget cuts require that we stay out of the news for behaving badly.

I recently saw a sign endorsing a fire levy that read, "Vote Yes for Your Heroes! I had several neighbors ask me, "Don't you think that is a little pompous?" If my own neighbors felt that way, I can assume a lot of other voters did, as well. Low and behold, the levy failed. Does this mean our citizens don't appreciate us? Does this mean they don't value our service? For the most part, the answer is no. But one thing I know about the electorate is that the best way to lose their support is to confuse them. I am not saying that calling ourselves heroes is confusing them. What I am saying is some of our "non-heroic" actions might be sending a mixed message.

First, The Bad News

You cannot read a blog, open a newspaper or listen to the evening news without hearing about outrageous behavior among our ranks. Fat retirements, overtime disproportionate to the private sector, pay scales well above the median, abuse of sick time and retirement buyouts are just part of the story. Although in many cases, these financial figures are staggering, it all pales in comparison to the unlawful and egregious actions of some of our own. This speaks to the heart of the problem—confusing Mrs. Smith. Today, she sees us as trusted champions who would risk our lives to save hers. Then tonight on the news she hears about us acting like greedy, oversexed, ill-behaved apes. (Before you get your panties in a bunch and send the fifth battalion to my house for overhaul, I realize there are two sides to every story and that some of these issues are extorted, exaggerated and often downright false.)

At a leadership retreat last year, a good friend of mine said, "I have seen the enemy, and it is us." He made this statement right after a news flash popped up on my iPhone: "Local firefighters out of the community playing ball. Who is protecting the residents?" This story broke in the middle of the worst economy we have seen in decades, and some people (including our Mrs. Smith and all her friends, neighbors and family) are losing everything. I know these firefighters were staying fit as suggested in NFPA 1500; they had the rigs with them so they could respond quickly, and they were not that far from their first-due area. But the news does not report this information, nor does Mrs. Smith understand it or even want to hear it.

> We can't afford to have our service splashed on the front page with stories of our ill-advised actions, our ill-gotten gains & our feelings of entitlement.

At the same retreat, another well-respected friend who lives in the mountains where animals eat people on a regular basis stated simply, "Don't poke the bear." When you see a grizzly, don't look the bear in the eyes and slowly back away. Considering the actions of some of our members and how we react to the negative press, we are undoubtedly poking the bear.

Since our brothers and sisters lost their lives on Sept. 11, 2001, we have had a bright spotlight shined upon us. We have confused voters—voters focused on self-preservation above all else, voters focused on feeding their young and saving their homes. Perhaps they believe local government spending stands in the way of their success and worsens their blight. Much like the grizzly trying to protect its territory and its cubs, they, too, will strike back when poked. This is why, in my opinion, we can't afford to have our service splashed on the front page of every newspaper with stories of our ill-advised actions, our ill-gotten gains and our feelings of entitlement. I certainly understand that the great majority of our ranks are doing the right thing. Unfortunately, many are not, and this is whom the media writes about and whom Mrs. Smith reads about.

Political Triage

So how do we get out of this mess? First, we stop the bleeding and stabilize. That might mean taking some cuts, reducing our numbers, rethinking our strategy and focusing on living to fight another day. This does not mean retreat. We should hold our ground where we can, but we must realize that sometimes you have to lose a lot before you can gain a lot. We cannot focus on tomorrow while we are fighting for our life today.

Just because we have taken a heavy blow does not mean our mission or our values have changed. Our next step is to regroup around those values and our mission and ensure they still illustrate the organization's desires and focus.

Next, we must focus on the customer. Do our visions, values and mission

statement align with Mrs. Smith's expectations? For us to sell our wares to our customers, we must first determine if they have a need for those wares and what they are willing to spend to fulfill their expectations. In one of Paul Combs' fire-service cartoons, shown on pg. 6, a chief is depicted with a mountain of responsibilities and tasks placed on his back—everything from RIT to suppression to EMS. We must stop the notion that we can be everything to everybody, especially if the community is not willing to fund it. We must educate our customers on what resources it takes to accomplish the necessary tasks, and we must stop selling our firefighters as jack-of-all-trades super heroes. We have done a yeoman's job of handling these tasks in the past, but look at where it has gotten us. We should use tools such as performance measures, statistics and facts to illustrate what it takes to do our job. The days of selling our value simply by playing on peoples' emotions is over.

We should explain our service in a way our customers understand. Mrs. Smith doesn't want to know about NFPA or ISO standards. If we cannot get her attention and keep it, our message is lost. In today's fast-paced world of iPhones, iPads and apps, it's challenging to get an audience's attention, let alone keep it long enough to make a sale. What the customer *does* understand is getting more for paying a bit more. *Example:* For $1, you can supersize your meal at almost any burger joint. How can we use that to our benefit? Educate our customers on "super sizing" the fire department. If you want EMS in 5 minutes, it will cost you a $1 million levy. If you want fire suppression in 6 minutes, it costs $2 million. If you want to supersize it and get us to your home in time to make a difference, then you need to add an additional $3 million. Results from customer feedback and eventually at the polls will be a clear indication of our customers' expectations. After all, the burger joint doesn't give you the supersize for free just because they can. You have to pay for it.

Our customers are busy managing their lives. They go full speed ahead from morning to night caring for their jobs, their children and their social lives. If we want their attention, we must bring our message to where they live: Starbucks, the gym, the school, the football field and the Internet. (Yes, the same Internet we discipline our folks for using while on duty.) Facebook, Twitter, LinkedIn—these offer the best opportunity to get our message across.

Many businesses across this country have been down and have made incredible recoveries. They did it by changing strategies, refreshing their ideas and regaining their market share. The American fire service can do the same. The only thing holding us back is us. We have the best work force in the nation, selling the best service in the nation. Let's stop whining, stop poking the bear and regain our market share. BS

Click this link! Tell Chief Huber what you think about this topic.

Chief Otto Huber has served his entire 32-year fire career with the Loveland-Symmes Fire Department, an ISO 2, CAAS accredited agency in southwest Ohio. Chief Huber as been chief of department for the past eight years and chief of operations for 17 years prior. He is a graduate of the Ohio Fire Executive Program Class 7 Instructed at the Ohio State University Fisher College of Business and is a member of the board of directors for the Clermont County Fire Chiefs.

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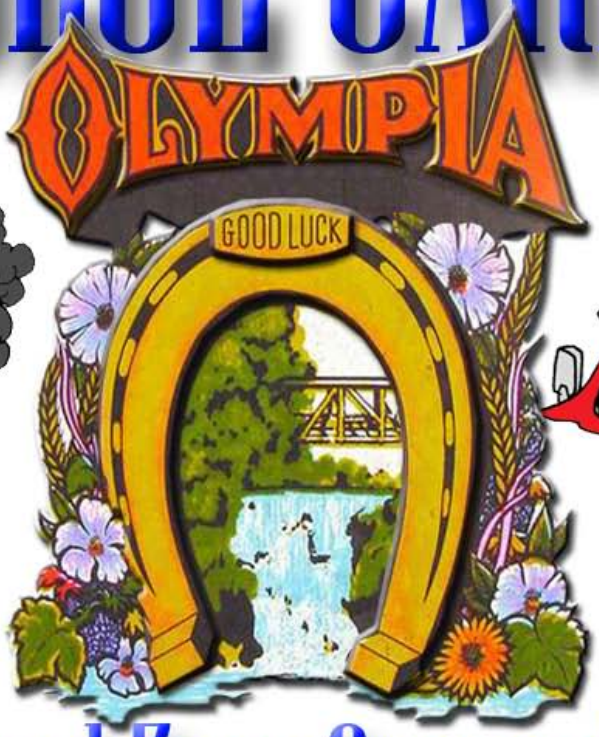

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Grin & Bear It

Sometimes customer service is delivered with a forced smile.

BY NICK BRUNACINI

ILLUSTRATION POONEY PICKERING

The first time I heard the concept of "customer service" was in a captains meeting. It was a year or so before Big Al turned the idea into a book. About 20 captains were in the room, and more than a few of them had started their careers before our department got into the EMS business. This was a prehistoric time, when our only customer was the fire. Big Al was sitting at the front of the room when he innocently (and diabolically) asked us, "What would you think if we considered the people who call for our service as 'customers' instead of 'victims'?"

The fire chief's question sparked a lively two-hour discussion that included statements such as: "It's about time"; "Bullshit! Why change the way I've been doing it for the last 20 years?"; "It doesn't matter what you call them, they will always be the enemy"; and the ever popular, "Who cares. What's for lunch?"

It's been more than a decade since Big Al suggested we could improve ourselves if we simply viewed the people calling for our help in a different way. Successful pillars of industry and civic leaders have long understood the powerful gain of delivering "value-added service" to their customers. This radical concept spread quickly throughout the fire service. In 1997, the "Wall Street Journal" proclaimed, "Chief Brunacini has created a customer-service culture that few private companies (let alone government agencies) could match." During the ensuing years, fire chiefs and union presidents throughout the land extolled the need to deliver quality customer service, making it one of the top organizational priorities. Many of today's officer-training programs include classes on managing your crew around delivering quality customer service.

Poop & Other Stuff (Some of it Good) Rolls Down Hill

When an organization decides to devote time, resources and energy to improving service delivery, the process must start at the top. The major challenge of implementing this organizational shift is the separation that exists

between the top of the organizational chain, where the proclamation is made, and the bottom, where the service is actually delivered. The true beauty of our profession is our validation process. It is very simple: "Does it really work in the street?"

I came of age in my fire department before Big Al had grabbed us by the neck and pulled us down the path of delivering a higher quality of service to Mrs. Smith. Once he let the customer-service genie out of its bottle, it quickly became the highest priority for the real leaders of our department, which is a good thing. If the wise and golden-souled philosophers running the department hadn't inspired a change on the organization's task level, "value-added service" would have become just another high-brow concept we mouth-breathers would have ridiculed and revolted against.

Until that point, I had been raised by a group of people who valued structural firefighting above all else. They saw it as our primary mission; if it wasn't on fire, it was lower priority, and we would only deal with it because we had to. My elders weren't rude, mean or even impatient with people. They simply had always felt we were a *fire* department, and our primary reason for existence was to put out *fires*. Over time, this attitude can manifest in undesirable ways. When everything that doesn't involve pressing a fire attack becomes secondary, eventually the organizational culture will dismiss it as nonessential. We have a name for these types of service requests: bullshit calls. Left unchecked, this thinking can lead to an adversarial relationship with your customer base, and we begin to function, and look like, just another government bureaucracy.

Our standard approach was to be nice because that was our basic nature. This is pretty easy to do when you respond on a call for a sweet old lady.

Looking back, this era of my career was the crossroads of my customer-service experience. We all understood our fire chief's passion and goal to improve the quality of the service we delivered. All the theories made sense, and we could see the future benefit improved customer service promised our department, our customers and us personally. This is all fine and dandy, but a lot of stuff can get in the way. How do you process all this new-age customer-service information when the customer(s) begin to eat away at your soul?

The Sweet Taste of Service

When our department took the leap into the bold new world of "value-added" customer service, I had just taken my first permanent assignment at a multi-company station on the east side of downtown Phoenix. Our station's first-due area was a melting pot of the lowest socio-economic members of our big desert city. I was the captain of a ladder company we had dubbed The Raging Queen. A paramedic engine and ambulance also ran out of our station. Each of the engineers assigned to the ladder were past the 20-year mark in their careers. The pair of them was laid-back and extremely competent at everything they did. A probationary firefighter rounded out our ladder-company quartet. Our station averaged more than 10,000 runs a year between the three pieces of apparatus. Extrications, working fires and ghetto violence accounted for much of our activity. We also delivered our fair share of garden-variety EMS. We'd show up, figure out what needed to be done, and then we did it.

Our standard approach was to be nice because that was our basic nature. This is pretty easy to do when you respond on a call for a sweet old lady who is having trouble with her gas stove and doesn't know what to do. On one particular call, our Mrs. Smith met us at the door and immediately began apologizing as she led us through her well-kept home and into her kitchen. Her countertop space was covered with homemade candy. Her last batch had

been a brittle, and the burner on her old stove wouldn't shut off all the way after a full day of duty. One of our talented engineers was also a mechanic. He turned off the gas valve behind the stove while the probie went out to the rig to retrieve the toolbox. Within 15 minutes, the engineer had the stove taken apart, put back together and working. It was just before dinner, and we had been eyeballing all the tasty treats. We spent the next 20 minutes enjoying a symphony of sweet heaven while the old lady shared bits of her life with us.

We shared a common lifestyle with our candy-making Mrs. Smith. We were all basically responsible citizens who bathed regularly, paid our taxes and followed society's important rules. Only a morally bankrupt individual would have been anything short of nice or helpful to the candy-making matron. The challenge the group of us faced was that a high percentage of our customer base fell into a different census tract. They were crazy, desperate, addicted or criminal. It's easy to be nice with sweet old ladies who demand that you try their macadamia nut brittle. It's a different case altogether when you're dealing with a drunken scofflaw who's just vomited on your shoes.

When Your Smith Is an A-Hole

The incident that did it for me happened during a shift that started like any other. An hour or so into it we were dispatched on an "ill man." As soon as the dispatcher spit out the address, the group of us had a pretty good idea concerning our customer's identity. For the sake of continuity and decorum, I will refer to our customer as "Mr. Smith." He had taken up residence next to a dumpster behind a gas station. Our station had responded on Mr. Smith five or six times a week the previous month. His general demeanor was equal parts stupidity, rage and intoxication.

We arrived to find half a dozen police cruisers congregated around back. Because it was Sunday, the gas station was closed. The police had been called to the scene because Mr. Smith was doing his bathroom duty on the side of a busy street. Having no respect for the law, he attacked the police after they suggested that he cease making a public spectacle of himself. After conducting our standard primary and secondary EMS surveys on Mr. Smith, we determined he had some superficial abrasions and bruises along with a severely swollen ankle. We bandaged Mr. Smith's abrasions, splinted his swollen ankle and called for an ambulance to transport him to the hospital. Having no further need or desire to hang out with the customer, the police bid us a fond farewell and went back to protecting the city. While we waited for the ambulance, Mr. Smith droned incoherently about the socio-economic disadvantages that come from living in a cardboard box next to a dumpster. I finished the EMS paperwork while our engineers counseled Mr. Smith about securing suitable housing, not fighting with the police and drinking more water than rotgut booze during the summer. The ambulance showed up a few minutes later. We gave them an overview of Mr. Smith's injuries, helped load patient Smith into the ambo and went on with the rest of our day. Another satisfied customer.

It was 10 o'clock that evening, and we had just finished with dinner. It had been a very brisk day for our three-company station; we were on track to do more than 50 runs for the shift. We were clearing the table and starting the dishes when the lights came on and the ceiling witches told us to respond to the gas station on the corner and "assist PD." We mounted the Raging Queen and headed out for our 12th call of the shift.

The scene that awaited us was eerily familiar to that morning's, the only differences being it was dark and it was a new shift of cops that currently had Mr. Smith facedown and handcuffed. Mr. Smith was wearing a plastic hospital bracelet and a white plaster cast on his foot and lower leg. The cast was so white it looked out of place, like an A-Shifter's tooth stuck in the middle of a

turd. A pair of aluminum crutches leaned against the cardboard box next to the dumpster. Mr. Smith's face was swollen and caked with old and new blood. Several other individuals behind the gas station were in police custody. One of the police officers broke away from the investigation to uncuff Mr. Smith. After dragging him to his feet, the cop looked at the group of us and with all the authority in the world declared, "He's yours." We repeated that morning's primary and secondary EMS surveys and determined that Mr. Smith's face had endured what the natives call an "ass-kicking." While we were in the process of bandaging Mr. Smith's swollen eye, he made multiple efforts to spit on us. Within a few minutes, the ambulance from our station arrived, thanked us for getting them out of doing the dishes and loaded Mr. Smith and his mummy-wrapped head into the ambo for that day's second trip to the hospital. It wasn't candy at granny's.

> The only thought I had ... was to inflict immense pain on the customer, who had just assaulted me with the wretched contents of his guts.

My customer-service epiphany came at 5 a.m. the next morning. We had managed to sandwich in another four or five calls since our after-dinner call with Mr. Smith. I had been asleep for 11 minutes when the electronic click that preceded the lights and tone shredded away my last bit of sanity. I opened my eyes a millisecond before the lights came on, and the accompanying tone shocked my brain for the umpteenth time that shift. The male dispatcher had a warlock's voice. He used it to command us to go back to the gas station. The group of us climbed onto our rig and responded in total silence. I used those 3 minutes to imagine the great pain I was going to inflict on this pariah of decent society. Mr. Smith was no longer a customer—he was my shift-long albatross.

As we pulled behind the gas station, I could see the sun starting to rise in the eastern sky. A pair of police officers had Mr. Smith cuffed up and face down. As I approached, I noticed his formerly brilliant white cast had taken on the appearance of its owner. Its bottom was shredded to little more than filthy cotton. Mr. Smith's foot was twice the size it had been a scant 17 hours ago, when we'd first seen him. The night-shift cops were a lot more talkative than their day- and swing-shift counterparts. They told us they found Mr. Smith in the middle of the road, swinging his crutch at passing cars. When they pulled over and got out of their car, he limped off behind the gas station. They gave chase. When they came around the corner of the building, Mr. Smith had tried to baseball bat them with his remaining crutch. This earned him his third ass-whipping of the day.

As my crew rolled Mr. Smith onto his back and into a sitting position, negative thoughts painted my world. I squatted down to share my professional feelings with Mr. Smith regarding his self-destructive lifestyle. Before I could get my first sentence out, Mr. Smith glared into my eyes and threw up all over my feet. He smiled at me. Blood and pus were seeping from his swollen eye, and strings of puke hung from his chin. The only thought I had at that moment was to inflict immense pain on the customer. The preceding three shifts of cops had their shot at Mr. Smith, now it was my turn. He had undone all the help we had given him, and he had just assaulted me with the wretched contents of his guts. As I stood up in preparation to clean my boots off on our customer, one of my engineers grabbed me by the arm and requested to speak with me behind our rig. I dutifully followed him.

"Why don't you sit the rest of this one out?" he said. "We'll take care of this, and hopefully the hospital will actually admit Mr. Smith so we don't have to deal with him for the next few shifts. Besides, if they kick him loose again, he'll most likely end up dead before we're back on duty."

I wasn't ready to let this one go.

"The only thing that will make me right is to hurt him," I replied, as calmly as possible. "I must strike back."

My engineer never raised his voice or lost his smile when he gave me final counsel.

"Our last captain was an asshole. He did his best to piss off all of the people we ran on because he thought he was better than everyone else. We were really happy when he took another spot. You can't let this moron turn you. Being mean is like any other compulsion. Once you start tuning up the scumbags who own this area, you become the same asshole they are. We don't want to work for another asshole. Go chill on the rig, and we'll wrap things up with Mr. Beat-to-Shit the Vomiter."

I took my engineer's advice and remained seated on the bumper of our rig. The 1-minute conversation with my engineer was so distracting, it killed the black rage that had owned me just a few seconds before. I watched the sun come up and contemplated my chosen profession. I was 10 years into a 30-year career. It dawned on me that the nicest members of our organization were also the toughest and most competent. This led to the realization that the few mean members of the department that I'd run across were weak, stupid, afraid or trying to compensate for some other personal deficiency. As I sat there, I considered how much I enjoyed what I did for a living, where I worked and whom I worked with. It became apparent that the few things I didn't like about my job were going to be a lot simpler if I just defaulted to being nice.

The Power of Nice

Our alarm room wasn't going to stop dispatching us on calls that didn't measure up to our level of training, capabilities and expectations. It doesn't take a rocket scientist to figure out we are going to spend the same amount of time on a call whether we're mean or nice. You quickly learn that when you're nice to others, they tend to return the favor. Nice is free and it procures otherwise unobtainable goodwill. Nice is even more powerful than that; the simple act of being nice can overcompensate in other ways. Our crew routinely responded on calls where there weren't any solutions for the customer. Fire departments are the last option for a large segment of the population. Many of our customers called for help that fell outside the traditional menu of emergency services. We'd show up and serve in the role of advocate for the customer, representing and protecting them from the systems they needed to access to get the long-term help they required. Sometimes we were successful at breaking through the labyrinth of government and bureaucracy. Other times, we'd run into the same brick walls our customers encountered. There were lots of times that our being nice was the only thing the customer was left with. As Big Al loves to say, "All our customer remembers is how we regarded them. They don't remember our technical proficiency, our impressive fleet of apparatus and equipment or our high level of expertise. The most powerful thing we leave them with is how we treated them."

During the course of my career, I've never received a more enlightening lecture than I did that morning. I firmly believe that a fire company is the strongest single thing within any fire department. The relationship that exists between the members of a crew will outperform anything short of a firing squad (or the promise of sex). This is even more powerful when the members of the crew like and respect one another. It's a pretty big deal when the head of the department adopts the policy that the members of the organization are going to make top-flight customer service their main priority. It's an even bigger deal when an engineer pulls his captain off to side to remind him that he's part of a group that prides itself of being decent human beings.

Delivering emergency service to the poor, addicted, self-destructive and

crazy can be a challenge. In the global sense, my engineer couldn't have been more correct. It wasn't my job to internalize, and then act out how I felt about the people we delivered service to. I joined a profession that didn't prequalify its customers. We deliver service to everyone—even the dead. Prejudicing the customer from the moment we make contact (or even as the call comes in) only creates frustration. When it becomes acceptable to be nasty to a certain demographic of your customer base, it creates a system where it's acceptable to be mean to anyone. In the end the choice wasn't the fire chief's, the union president's or even my well-centered engineer's—it belonged to me. BS

***Click here!* Visit Nick's blog to discuss your opinions of his artistic expression.**

Nick Brunacini joined the Phoenix Fire Department (PFD) in 1980. He served seven years as a firefighter on different engine companies before promoting to captain and working nine years on a ladder company. Nick served as a battalion chief for five years and in 2001, he was promoted to shift commander. He then spent the next five years developing and teaching the Blue Card curriculum at the PFD's Command Training Center. His last assignment with the PFD was South Shift commander; he retired from the department in 2009. Nick is the author of "B-Shifter—A Firefighter's Memoir." He is also the co-author of "Command Safety" and "The Anatomy and Physiology of Leadership."

Training Targets

Set your sights on specific training goals & outcomes for positive training results.

BY FOREST REEDER

Many instructors and officers struggle with applying coursework or firefighting standards to the real world. Myriad department types, sizes, demographics and training methods make this a significant challenge. So far, this series of articles has focused on the premise that instructors and trainers need experience, common sense and practice, which we offer through some "what would you do" scenarios. In training, we have a little more discretionary time for decision-making than we do on the fireground. Therefore, you have room to weigh the possible outcomes of a variety of different solutions to your concerns.

PHOTO ROGER STEVENS

No, you're not boring. But maybe your presentation is. When a training session turns into a snooze fest, it's time to rethink your approach.

No matter what the training subject and no matter what your role or rank, we as instructors desire positive outcomes—ones where people learn something, practice something or improve their safety. Most curriculums provide the reference source for the training content, but it's up to you to make it realistic and relevant. (A textbook or standard might provide you with some direction, but don't overlook the importance of referring to your departments SOPs, examining past practices and tapping your network of peers for their feedback.) Make decisions based on your training's "takeaway" message. Be specific about your goals for each training session. Focus on fewer but higher levels of performance outcomes vs. randomly firing a shotgun and hoping to hit a few key points. Think of it as using one of those red laser sights on your training content. Pick the elements that ensure operational safety, good service and member survival and make sure everyone walks away with improvements in those areas. Each drill must make the participant better, faster, safer or smarter than they were at the start of the training session, or we are not meeting our training mission. Let's get to work putting your experiences and best practices to work on this quarter's instructor scenarios.

Click here! What do you think about these scenarios and my responses? Discuss your opinions and those of others in my blog.

Scenario 1

Your class is struggling to remain conscious during your lengthy PowerPoint presentation. You worry that significant neck injuries might occur if you don't do something fast. There are many, many more slides to cover, and you will test them on the material at the end of class. How can you adjust the learning environment or material to complete an effective training session?

A. Take a break. When you reconvene, only deliver the material on the test;
B. Break the class for a few moments and change the delivery method to involve more student participation. Get them involved by asking questions about slide content;

C. Continue presenting all the content and hope they absorb the key points; or
D. Apologize for the content, blame the publisher or author and provide a review of the test so they don't end up challenging the exam.

Answer: We've all probably been down this road, struggling at the head of the class like Ben Stein in "Ferris Bueller's Day Off." In this case, B is probably your best bet. If you know your content well enough, you can pull the highlights of the presentation into scenario-based questions or exercises. I've even turned off the projector and worked from just my outline to trigger conversation and encourage students to think about real-world applications.

Scenario 2

You are scheduled to deliver one day of a multiple-day training course at a regional fire school. You come into the class near the end of the course and have had no interaction with the students until now. You introduce yourself and summarize what you intend to cover. You ask some "progress check" questions relating to the material covered in previous days. Clearly one or several of the previous instructors spent more time on "war stories" than lesson plans. The previous classes included extended breaks and lunch hours and ended early, too. From your experience, you know much of the missed material is on the final examination, and assignments related to that material are due on the last day of class. The class seems frustrated with the program in general. What should you do?

A. Recap the missed or lightly covered content with a "highlight reel" before getting into your presentation;
B. Don't worry about it! It won't reflect on your portion of the course evaluation. Have the students take it up with the coordinator or lead instructor;
C. Blend the missed information's key points into your topic. If possible, include scenarios and discussions that tie in the missing information; or
D. Follow-up with the other instructors who have made your job difficult.

Answer: This could be an all-of-the above scenario. I don't personally believe that choice B will be the best for the students, even though this isn't a problem you created. You have inherited a bit of a mess and highlighting some key points (A) while blending in scenario discussions (C) and then having a discussion of the impact of this situation (D) offers the most damage control.

Scenario 3

An academy student or recruit firefighter fails to meet standards on multiple occasions, and you are becoming frustrated with their lack of performance. How do you deal with an individual student's incompetence?

A. Document.
B. Document, and prepare a personal-improvement plan for the student, which will include detailed expectations of how you want them to resolve their performance issues. This should include extra study time, outlining lesson content, or skill drills on their own time;
C. Document, and have the student develop their own improvement plan where they will determine their strategy for success. Plan on signing off on the plan and holding them accountable to it. After documentation and application of the improvement plan, you may have to take additional actions up to and including dismissal from the program or department; or
D. All of the above, and then some.

Answer: Here's your no brainer, at least at first. Your department must provide clear direction for you based on choice E, "all of the above." This situation could definitely deteriorate into anything from a safety-related disaster

or result in the dismissal or termination of the member. Documentation using local procedures and citing exactly what the performance issues are will be your only means of survival here. A personal-improvement plan will be necessary from both sides—yours and theirs. I really believe (and NFPA 1500 5.1.9 says so, too) that members have a stake in developing and maintaining knowledge and ability on their own terms. Have this student list what they are going to do to improve themselves. If you are comfortable, sign off on it and hold them accountable to work toward improvement.

Scenario 4

You have been asked to develop a skill-evaluation package for a firefighter who has been off-duty for a period of time due to an injury that occurred at a fire scene. The department physician has approved their return to duty, but the chief wants to assess their basic skills to make sure they are safe and ready to go back on the line. Your department has no past practices, resources or references on this type of situation, so you are struggling with what to include in the assessment package. What would you do in this situation?

A. Have the chief provide a list of the subjects or skills that should be tested based on their concern over the return-to-duty status;

B. Review the reason for the injury. If, for example, the injury involved a muscular/skeletal injury, use skills that focus on testing just that area. For a back injury, focus on flexibility and lifting skills;

C. Draft a list of essential skills covering a broad range of tasks that are usually required to do that person's job. Reviewing the current job description for this position is essential, along with the creation or reference to some sort of performance standard. Exercise caution and ensure the skills can be completed and are attainable by all others in the same job class. Clear outcomes and goals are necessary; or

D. Recommend the member attend a regional academy or use an instructor from another department for the assessment to remove any potential bias in the evaluation process.

Answer: In this scenario, I think choice C would probably cover most of your concerns. BS

Extra Credit Homework

Follow-up questions for Scenario 4.

Scenario 4 presents an interesting problem, and I've offered a few possible solutions. To further prepare for similar situations, consider these follow-up questions:

1. *How would you document this process?*
2. *What happens if the member fails portions of or the entire program, especially since the department physician has determined the member is fit for duty?*
3. *What standards could you reference for this process?*
4. *Are there any potential grounds for poor labor/management interaction due to this scenario?*
5. *How will you approach this in a positive "for your safety and the safety of your fellow crew members" way?*

Please share your insights on my blog, or email them to editorial@bshifter.com. Please write Trainer's Workout in the subject line. Thank you!

Forest Reeder began his fire-service career in 1978 and currently serves as a division chief of Training & Safety with the Des Plaines (Ill.) Fire Department. Forest writes the weekly drill feature at www.firefighterclosecalls.com and www.fireengineering.com, and was a contributing author of "Fire Service Instructor, Principles and Practices," published by Jones and Bartlett. Forest was awarded the ISFSI's George Post Instructor of the Year at FDIC in 2008.

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Big Shop of Horrors

Not your average fire, shopping malls present a challenging array of hazards.

BY VINCENT DUNN

Shopping mall fires are more dangerous and more difficult to extinguish than residential fires. Malls can contain one large store or many small stores in one large structure. When a shopping mall contains many small stores, the firefighting problem is exacerbated for several reasons. Read on for more information on how to manage fires in these structures.

PHOTO BEN HEYS/BIG STOCK PHOTO

The suspended ceilings common in modern malls can conceal fire spread. They also present a dangerous collapse hazard.

Well Stocked with Hazards

A shopping mall may contain 10 or more small stores within one large structure. The smaller stores, separated by partition walls, can vary in size. These separate occupancies can serve varying purposes: retail clothing stores, restaurants, auto-repair shops, florists, garden stores, furniture stores, laundry mats, electronics stores, hardware stores and even movie theaters. Sometimes the only thing any of these stores have in common is their roof space. This common roof space sits between the ceiling and the underside of the roof and can extend over an entire row of stores. Any fire that burns through one ceiling can work its way into the common roof space and spread over all the stores in the mall.

Other factors making fires in shopping malls difficult to extinguish include collapse hazards, large quantities of flammable contents, inadequate side ventilation and limited access to stores and the vent openings from the mall's rear. In addition, when you inspect a row of stores in a shopping mall, you'll find no standard layout from store to store. Each store can be a different size and shape, and any of the stores may contain explosion hazards. Considering the occupancy types listed above, typical mall hazards might include cooking oils, gasoline storage, propane storage, garden fertilizer, household paint, spray paint and modern furnishings.

Mall fires are also dangerous due to how the mall was built and, in some cases, reconstructed. Lightweight truss construction and improper ceiling and floor renovations present two common collapse hazards. Parapet walls, marquees, canopies and cornices are also prone to collapse under fire conditions (see "They All Fall Down," pg. 23). Trap-door floor openings (leading to the basement or cellar) and other floors weakened by heavy storage are also likely to give way. Always beware and proceed with caution.

Shopping for Strategies

When responding to fires in shopping malls, consider the following strategies to ensure a quick knockdown and to impede the fire's spread.

Locate the Fire & Prioritize Exposures—An incident commander's (IC) first

strategy at a shopping mall fire is to locate the main body of fire. This is easier said than done. If the fire occurs at night or on holidays when the stores are closed, several of the stores might show heavy smoke. If so, look inside all the store windows for flame. If you can't see any, the store with the greatest amount of smoke is likely the fire source. If several stores contain heavy smoke, look for signs of heat condensation on windows or glass doors—especially on cool nights.

If the storefronts have metal rolldown gates, and if the windows have broken from the fire, look for signs of heat discoloration on the metal. Once you pinpoint the fire's location, always check that store's cellar/basement, because the fire may have started there.

As soon as possible after arriving and locating the fire, the IC must determine which of the adjoining stores to protect first. If the IC gets this wrong, the fire could spread quickly through the common roof space and consume the whole store. In most instances, follow the smoke; the fire will move in the same direction the smoke flows, which is downwind. As the wind pushes smoke outside the store, it will also push heat and flame inside the common roof space.

Any fire that burns through one ceiling can work its way into the common roof space & spread over all the stores.

Open the Gates—If the stores have metal rolldown security gates, open the adjoining stores' gates as soon as you locate the fire source, starting with the store downwind of the fire store. As stated previously, flames *will* spread through the common roof space to the adjoining stores, so be proactive. Do not wait for fire to spread before you begin forcible entry. You don't want to play catch up with a common roof-space fire. If you have available staffing, assign one company on arrival to open every rolldown gate within the entire row of stores.

Vent—Venting is one of the most important firefighting strategies an IC can use to stop fire in a mall. It is almost as important as positioning the hoselines. However, venting a fire in a row of stores is complex. For example, we can vent skylights and scuttle covers immediately, which will release smoke and heat, slowing the fire's spread through the ceiling and into the common roof space. Window venting requires more coordination. Unlike roof venting, we must coordinate venting storefront and rear windows with the advance of the hoseline to avoid spreading the fire or causing flashover. If it's possible to vent rear doors and windows, open them to allow smoke and heat to be pushed out by the advancing hose team. Vent all the storefront glass when the first attack line starts to advance on the fire. Even if an explosion occurs, some of the blast will be diverted up and out of the store through the roof and rear vents, away from the firefighters advancing the hoseline. Venting the skylights and scuttles can slow down the time until a flashover.

Stop the Spread—The No. 1 goal at a mall fire is to keep the fire from spreading to the common roof space. There are many ways fire spreads to the common roof space:

Through the ceiling tiles;
Up a partition wall;
Through a ceiling poke-through hole;
Through a utility closet;
Through a light fixture; and
Out of a store window and up through the eaves.

If a firefighter operating on the roof determines flames (not just smoke) have spread to the common roof space, they should cut the roof deck to vent smoke and heat. Cut the vent opening as close as safely possible over the spot where fire is burning in an attempt to push down the ceiling and create

air flow/vertical air movement. This roof vent encourages the fire to move vertically out of the common roof space and can prevent or delay the fire's horizontal spread to adjoining stores. This should buy time for firefighters to position hoselines into the adjoining stores, pull ceilings and extinguish any fire in the common roof space.

When fire in a concealed space spreads vertically up to the common roof space over one store, assume the flames *will* spread horizontally throughout the common roof space on both sides and, if we don't stop them, they will destroy all the stores in the shopping mall. Sometimes partitions and walls are used to separate stores in the common roof space. *Do not* depend on these fire partitions or walls. Even if these barriers exist, utility openings and HVAC ducts can allow the fire to spread.

The IC should order an aerial ladder to be positioned downwind from the fire store for use as a defensive attack with an aerial master stream in case the interior attack proves unsuccessful.

Place Hoseline—Our overall hoseline strategy is the first line in the store protects life; the second line prevents fire extension; and the third line confines the fire.

Hoseline placement in a shopping mall should be as follows:

1) Stretch the first hoseline into the fire store, searching for victims as the hose team moves forward. Even if the store is locked, there could be night workers present. Retail clothing stores restock and rearrange clothes at night, and in some restaurants, families illegally sleep in back rooms. During a fire, workers may take refuge in a basement, so always check there as well.

2) Since we know fire in the concealed roof space will travel downwind, the IC should order the next hoselines in the store downwind of the fire store.

3) Stretch hoselines to the store/exposure upwind of the fire store.

Fire crews operating hoselines in either exposure should pull open the ceilings with pike poles along the wall that separate it from the fire store. After opening the ceiling, direct the hose stream at any fire coming across the common roof space above the partition wall.

Note: The rear of a shopping mall is usually not an exposure because it usually has a large loading zone.

Check for Spread—After extinguishing the main body of the fire, fire officers should open up the walls and ceilings around the fire area to ensure the fire has not spread. Use pike poles to open up the ceiling and walls near the fire. As mentioned previously, we must check the partition wall between the fire store and its exposures for vertical fire spread. If available, use a thermal imaging camera to detect fire in concealed spaces. When using tools to check for fire behind walls or ceilings, people sometimes wonder how large an opening to create. You should keep opening the walls or ceiling until you see clean, uncharred and unburned wood or clean metal inside the concealed space.

PHOTO CHAD MCDERMOTT/BIG STOCK PHOTO

PHOTO MARK WINFREY/BIG STOCK PHOTO

Top: Malls contain a variety of contents—everything from clothing to restaurant supplies to propane. Each adds a distinct element of danger to the fire hazard.

Bottom: The devil is in the details. Decorative exterior elements can fail and collapse when exposed to fire or battered with master streams.

A Note on Explosions

Explosions occur in burning strip stores more frequently than in burning residential buildings. One reason is because there are no side windows to vent, and the rear is usually secured tightly to discourage theft. Also, as mentioned

previously, some stores contain explosive material such as cooking oils, gas lines, flammable liquids, paints and propane gas. Flammable liquid is the weapon of choice for an arsonist, and arson-for-profit fires frequently occur in stores during a recession. A backdraft, smoke explosion or any explosion can occur when the store is tightly sealed up and fire burns undetected for hours.

To protect against explosions in a mall, the rule is: vent, flank, quench.

1. Vent the skylight and scuttle covers immediately. This may dissipate any explosive mixture building up in the store. Next, if there are rear windows or doors, open them when the hose team starts advancing from the front of the store.

2. If beginning to enter the burning storefront and the amount of fire visible through the windows indicates potential explosion, position the hoseline to the side of the store, in a flanking position, away from a possible blast blowing out of the store. Do this before starting other forcible-entry operations.

3. There is a general rule in the fire service that says, "Do not direct a hose stream at smoke." This rule does not apply when there is a danger of explosion. A hose stream directed into smoke may break up the explosive atmosphere. This is called "quenching an explosion." This is not as effective as venting, but it must be considered. The hose streams could cool the explosive atmosphere and change the explosive mixture.

They All Fall Down

Many collapse dangers exist at mall fires. Suspended ceilings are among the most common. If fire spreads above a suspended ceiling and destroys the hanger straps holding it, the entire ceiling and its heavy framework can collapse in one section. Several hundred pounds of ceiling can crush and trap firefighters searching for victims and advancing a hoseline. To prevent entrapment from a ceiling collapse, when entering a store where you suspect fire above the ceiling, open a hole in the ceiling near the entrance to check for fire. Next, extinguish the contents fire before it spreads to the ceiling, but realize the weight of the water from a hose stream can overload a ceiling and cause it to collapse, as well. (A hoseline discharging 180 gpm throws ¾ ton of water per minute.) As soon as you've knocked down the fire, use a pike pole and check the ceiling space for extension. Realize there may be several suspended ceilings, so pull each one until you get to the underside of the roof. When fire involves the space above several dropped ceilings and cannot be controlled, withdraw firefighters from the store and protect exposures using aerial master streams.

A decorative masonry parapet wall built over the front of a row of one-story strip stores presents another collapse danger. A parapet is defined as a vertical continuation of an exterior front wall above the roof level. The portion of a front wall rising above a roof is the parapet. A steel beam spans the large windows and supports the parapet wall. An explosion, the impact of a master stream or an aerial ladder can provide enough shock to trigger a parapet collapse. If during a fire the steel beam designed to support the parapet heats to 1,100 F and starts to expand, warp, twist or sag, it can cause a parapet wall to topple off its foundation.

A cornice, sometimes called an eyebrow, is a decorative, horizontal overhang, projecting outward along a store's top wall. If a parapet is defined as a portion of an exterior wall extending above the roof, a cornice can be defined as a portion of the roof extending horizontally beyond an exterior wall. A cornice is a cantilever structure, supported only at one end. They can be constructed of wood or combustible plastic and might have a wood framework inside and/or wood shingles outside. Flames blowing out of a store's front window can spread to the cornice before moving along the

underside of the cornice or inside its hollow framework, possibly to adjoining stores. As the spreading flames destroy the cornice's supports, it can collapse. Also, when fire weakens a cornice, it can collapse due to the sudden impact of a ladder or the blast of a powerful master stream. If a parapet or cornice does collapse, it will crash down like a wave of death and destruction on firefighters operating in doorways or sidewalks in front of the store. Firefighters operating at one end of a building can be crushed under a falling cornice that starts to collapse at the other end. When the strip store has a parapet or cornice in danger of collapse, the incident commander should establish a collapse zone. Firefighters should not enter the collapse zone. A minimum collapse zone should be a distance away from the front wall of the strip store equal to the height of the front wall, or 1.5 to 2 times the height of the wall if the IC chooses.

Conclusion

Fires in shopping malls are more difficult to extinguish because of the common roof space, large quantities of flammable content, the lack of side ventilation and limited rear access. These features sometimes allow fire to spread vertically into the common roof space and then horizontally over all stores in the row. The fire tactics of venting and stretching hoseline to extinguish fire, prevent extension and protect exposures stores must be coordinated and accomplished almost simultaneously. This requires a large commitment of firefighters on the initial alarm response. BS

Click here! Questions or comments for Vincent Dunn? Join the discussion at his blog.

Chief Vincent Dunn, FDNY (ret.), is a 40-year veteran. He is the author of "Collapse of Burning Buildings" (Fire Engineering, Revised 2010); "Safety and Survival on the Fireground" (Fire Engineering, 1992); "Command and Control of Fires and Emergencies" (Fire Engineering, 2000); and his most recent textbook "Strategy of Firefighting" (Fire Engineering 2007). He can be contacted at vincentdunn@earthlink.net or 800.231.3388. Visit him online at www.vincentdunn.com.

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A Boy, His Dog & His 1952 L-Model Mack

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It's About Time

Use the 5-minute rule for interview success.

BY M.C. HYYPPA

He greeted us with a firm handshake and direct eye contact. His hands were rough with calluses. He wore his suit as if it were made of tissue paper. It didn't appear to be a style of clothing with which he had much comfort or familiarity. You could see he was nervous, but he was not awkward. His eyes were clear and direct. Five thousand people had taken the fire department written exam. He was one of 300 who got an oral interview. There were 26 positions to fill. Before we ever asked him a question, I knew this man worked hard for his living.

Every question an employer asks you in an oral interview is, by its very nature, developed to garner one simple piece of information: Would you be a cost-effective expenditure? It doesn't matter what they ask, what they want to know is can you do the work. As far as an employer is concerned, a correct answer is one in which you come across as a worker with lots of bang for very little buck.

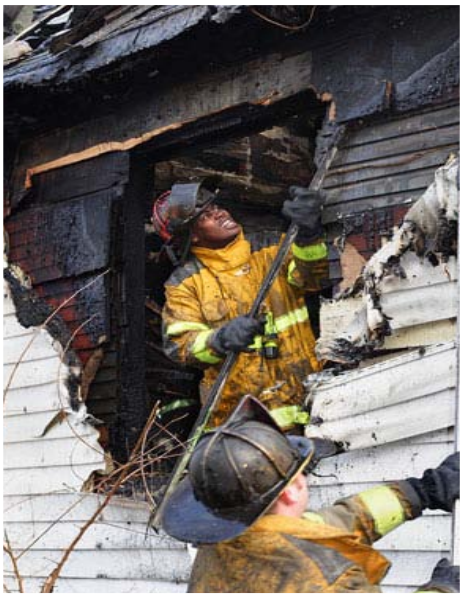


PHOTO SUSAN TUCKER/BIG STOCK PHOTO

For each interview question, you have about 5 minutes to "show" your potential employer the type of worker you are. How do you get the job done?

Time Is Everything

From start to finish, how long or short should an answer be? The length of your answers, or the actual time you are allowed to answer a question, might require a little research. Sometimes the employer you are testing for will let you know the duration of the interview when they notify you of the date, time and location. If not, a call to the human resources or personnel department is necessary. Find out the length of the interview, and if possible, how many questions will be asked. The rest is basic math. If you have 30 minutes and four questions, your answers need to be around 5 minutes long—taking into account introductions, reading of the questions and such.

Once you have developed your personal work stories—your answers—start timing yourself. Practice one answer to one question until you can speak comfortably—without fluff—for 5 minutes. We can make this even simpler. One answer can very easily be broken into four 1-minute vignettes—or four 1-minute anecdotes directed at each of the four factors of employment discussed in previous columns. This is no different than taking an agility test. If you worry about the entire test all at once, you will exhaust yourself. If you take it one event at a time, it becomes a much more manageable task. Anyone can pull a hoseline or drag a bag of sand. I watched a woman older than 40, with scoliosis and a metal plate in her head, turn eight evolutions (set at a tension of 80 pounds) on a hydrant prop. Any one person can do one thing at one time. Your interview can be broken into one 60-second micro burst at a time.

It's You, Working

The gentleman with the rough hands had, give or take, a formal 30-minute interview. It was recorded, and he was asked the same five questions every other applicant was asked. In order to ensure fairness, the interviewers could

not deviate from the script or redirect any questions. His interview, from start to finish, lasted 9 minutes. It took us longer to ask the questions than it did for him to answer them. One of our questions had to do with employee theft. He looked at us and said, "You are a person who steals, or you are a person who does not steal. I-do-not-steal, I-do-my-work." That was it. No nonsense, no bluster. One sentence said quietly, with a ring of truth and honesty so palpable it hung in the air. All four members on his board would have loved to have him assigned on their truck or in their battalion.

Your task in an interview is spoken word. You can't merely imply your abilities; you have to show them. When our rough-handed candidate left the room, we didn't know what he did for a living. We did not know if he had a family, if he had been in the military or if he was a college graduate. After he had answered the last question and we turned off his tape, we still had no idea how he had gotten those calluses. He was nowhere to be found in his answers. We could not hire him. In an oral interview, a short one-sentence answer has no content and is a wrong answer.

Our man with callused hands could have turned things around quite simply. He said he does not steal, but he failed to use his time to describe previous work situations that illustrated that fact. Let's address this point as an actual answer. What can you steal from your Employer? From your co-workers? From the customers? Can you steal from your self? (We just hit on all four employment factors.) Show examples of the lack of stealing. Show honesty: keeping accurate invoices, maintaining confidentiality, maintaining standards and protocol and accurate documentation. Show reliable, solid behavior. Are you good relief and the kind of co-worker that adds to the team? You need to let your interviewers know that no one has ever rolled their eyes at you, or run to lock up their valuables and braced themselves for a long shift when they saw you walk through the door. It's not about stealing, it's about working—you doing good work. Stealing adds a cost for an employer that they do not want to pay.

Conclusion

A correct answer has some very important components. Let's call them content, length and premeditation. The meat and potatoes of a smart, savvy reply is all about you being a glorious, cost-effective worker. An answer's length is also crucial. Regardless of the question, if you don't use the full time allotted to share examples of your work performance, no one will be able to find you in the answer. Who will they have to hire if *you* are not in the answer? This takes us back to content (content = you working). No content, no answer, no you, no job. Five minutes of actual, spoken-out-loud, reality-based work anecdotes, rather than flightless, wing-flapping bullshit, defines a quality answer. And it is not difficult, especially if you handle it one 60-second bite at a time. It takes practice and preparation to pull it off. You absolutely must have your personal work stories lined up and ready to go. You need to be able to talk for at least 5 minutes at a time. This is premeditation. If you can't prepare your personal work stories before the interview, how are you supposed to do them during your interview? BS

Click here! Ask M.C. Hyyppa questions or share comments with other members of our online community.

The author of "You're Hired": What you need to know about your job interview questions and answers," MC Hyyppa left the Phoenix Fire Department as a BLS captain to work for the Glendale (Ariz.) Fire Department as a responding battalion chief. Hyyppa currently lives on the Central California coastline.

There's Always Time to Make Things Better

B SHIFTER catches two departments doing things right.

BY B SHIFTER STAFF

In the previous issue of B SHIFTER, we invited you to share your positive service-delivery experiences with us. Telling others about the ways your department goes beyond the norm to help its customers isn't an exercise in bragging; it's a way show each other the benefits of being nice. Not only does it feel good, being nice helps us earn (and maintain) a good reputation in our communities. It's a lot easier to do our jobs when people are happy to see us coming and know we will treat them with care and respect.

We received several inspiring submissions, and we thank all of you who participated. This issue, we chose two entries. Members of these departments spent time and effort helping people in ways that go way above and beyond the job description.

PHOTO COURTESY BEECH GROVE FIRE DEPARTMENT

Congratulations to members of the Beech Grove Fire Department! Pictured from left to right: Engineer David Ansel, Captain John Bishop, Firefighter Sean Toler, Firefighter Angela Lechtenberg and Firefighter Randall Hadler.

The Nuts & Bolts of Service

We all have our regular customers (aka frequent flyers). About one or two times per month, we would get a non-emergency call to this particular residence for what we call a "lift assist." The male resident has limited mobility, and while moving from his bed to the chair (or vice versa), he would sometimes slide to the floor. He was never injured, but his wife was unable to help him up.

The homeowners are both elderly, and besides a home health aid, we rarely saw any other family members. In the fall of 2011, each of our three shifts responded to that residence on consecutive days. While we were there, we discovered that the rail on his hospital bed had become so loose that when he turned over, it allowed him to roll off the bed.

We decided to trouble-shoot the rail. After moving him to his chair and removing the mattress, we discovered that a bolt had fallen off, making the rail unstable. Since we could not find the bolt, I told the homeowners we would make a trip to the hardware store and return later to fix the rail. Later that morning, we returned with the necessary hardware and repaired the bed. We also discovered that their screen door was falling off, so we repaired that also. Taking just a little bit of our time made a safer environment for two of our citizens.

Captain John J. Bishop
Beech Grove Fire Department
Beech Grove, Indiana

Click Bruno's mug to launch his video response to this issue's submissions.

Child's Play

Our department was paged for an EMS call in the Stream Stone neighborhood. Engine 5 responded with a four-person crew and Medic 5 responded with a two-person crew. Ambulance 5 and its two-person crew arrived just ahead of the other company units.

Our customer, a young female with complications from recent child birth, required transport to the emergency room for further evaluation. Company 5 members gathered the items necessary for the infant and the customer so Ambulance 5 could transport them to the hospital.

While Ambulance 5 cared for the customer and her infant, Company 5 members provided care for her other children—two young twins. As she and her infant were loaded on the ambulance, the mother told us she had contacted her babysitter. Company 5 members assured her they would be looked after and taken to their babysitter.

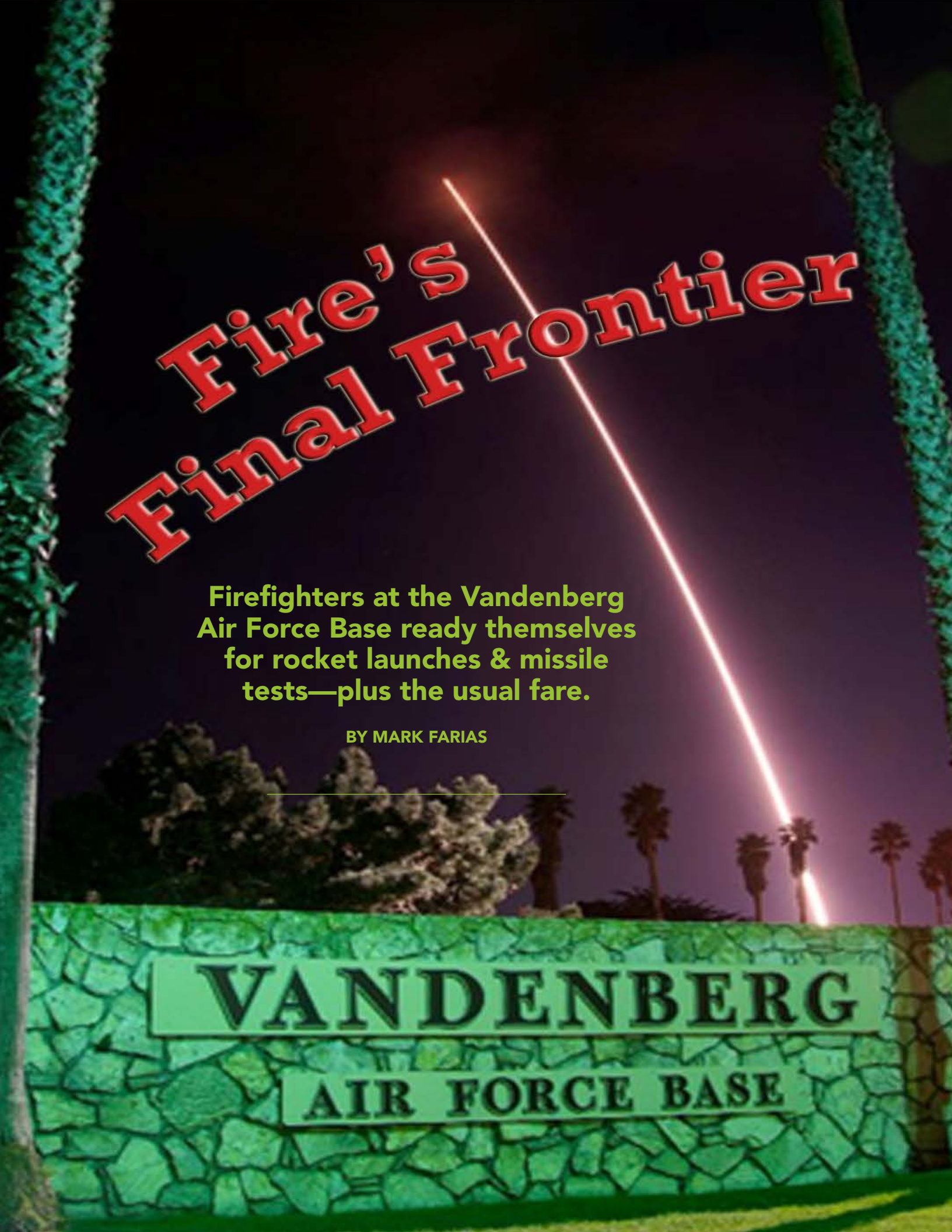
While the patient was transported to the hospital, Engine 5 members cleaned her kitchen and entertained the children while Medic 5 installed child seats in the rig so the children could be transported safely to the babysitter. Entertainment included the famous inflated blue EMS glove with faces drawn on it and voices from the firefighters—including a 300-pound former NFL defensive end. The twins *loved* the whole firefighter-with-glove-and-voices routine. The defensive end became their new best friend.

The children were taken to the babysitter's facility. The staff informed Medic 5's crew that she had been in contact with the customer and her spouse. The children were left with the babysitter, and the crews returned to Station 5. The members had a great time with the family and kids. They all had big smiles from helping out the family. Later, the family brought cookies for the crews.

Reader wishes to remain anonymous

Are you nice? Tell us about it! Please e-mail a brief description of your positive service-delivery experience to editorial@bshifter.com. Please write BE NICE in the subject line. Deadline is June 15, 2012. The customer-contact event can be a routine call where someone delivered really excellent core service and left the customer with a positive feeling, or it can be a situation where someone delivered added-value (a little extra) service that produced a "Wow!" outcome. Or maybe you've had an experience that you would handle differently next time. We can learn from those situations, too.

Keep your story as brief as possible (three or four paragraphs) while still including enough detail. Bruno and other members of the B Shifter staff will choose a story or stories to showcase in each issue. Please include your mailing address with your submission, and we will send your company a set of nifty BE NICE helmet stickers so everyone will know you are serious about being nice. BS



Fire's Final Frontier

Firefighters at the Vandenberg Air Force Base ready themselves for rocket launches & missile tests—plus the usual fare.

BY MARK FARIAS

Vandenberg Air Force Base (VAFB) firefighters make their home in the fast lane, providing direct emergency response to land, air, space and sea incidents. Part of the 30th Space Wing located on the Central Coast of California, VAFB is the busiest spaceport on the planet. Vandanberg Fire Department (VFD) firefighters have adopted the motto, "Semper Gumby," a reminder to always remain flexible when facing varied challenges and sometimes limited staffing.

VFD serves an area with 999 military and civilian residences, 31 dormitories and a population of 5,500, including 1,500 military members and space-school students. It's total daytime population—including family/dependent residents—is 16,500. In addition to the typical industrial, commercial and residential response issues most departments tackle, VFD firefighters face a number of space-related safety and response challenges. For example, the majority of all U.S. satellite launches and all Air Force Space Command space and missile launches occur at VAFB. In addition, the base manages launches for the Department of Defense (DoD), National Aeronautics and Space Administration (NASA), National Reconnaissance Office, various commercial entities (e.g., the United Launch Alliance—Boeing/Lockheed-Martin), and foreign nations. A variety of our nation's coolest space vehicles blast off from here, including Atlas V, Delta IV, Delta II, Pegasus, Minotaur, Falcon and Taurus (see photos, right). VAFB also tests and validates the nation's intercontinental ballistic missile arsenal and supports the Missile Defense Agency interceptor tests and operations.

The VFD responds to 42 miles of coastline with both recreational and commercial operations. A major railway system slices the base, transporting millions of tons of hazardous cargo and about 250,000 people annually. VAFB's runway and range host more than 4,000 aircraft missions per year. Rocket launches require fuel, and VAFB provides rocket-fuel storage and processing sites, posing tremendous hazmat challenges. Many of the more exotic rocket fuels require specialized response equipment and are incredibly reactive to normal firefighting agents should something go wrong in the processing, fueling or stacking events. Therefore, the VFD developed specific engagement protocols and a wide variety of training benchmarks. Making all the above more threatening, the base has one of the most imposing wildland-urban interfaces in all of the DoD. These issues—hazmat, waterways, rail cars, etc.—require in-depth specialized rescue training.

The Team

The VFD comprises 120 military and civilian firefighters and staff personnel working side-by-side out of six fire stations. Shift firefighters work a 24-hour on/off schedule (as do most federal departments), but the department is working toward a 48-hour on/off schedule. (This change would benefit both the firefighters and the fire department. A 48-hour on-off schedule allows firefighters to spend more continuous time with their families, more continuous time at work—increasing productivity—and reduces travel time by 50 percent.)

All VFD firefighters must achieve and maintain the appropriate NFPA pro-board firefighter certifications for their positions (www.theproboard.org). Its military firefighters also attend a grueling fire academy at Goodfellow Air Force Base. The academy's course content is NFPA compliant, pro-board certified and is considered one of the finest fire-training curriculums in the world. In addition, VFD military firefighters must achieve specific DoD firefighter certifications. They maintain numerous wartime qualifications because they constantly deploy to the Middle East and other parts of the world. These additional training/certification requirements include:

* Small arms;

The Titan IV takes off from VAFB.

Space vehicles, such as the Atlas V, shown here and below, require specialized planning for VFD and other key players.

Atlas stacking operations.

The Delta II, in service from 1989 through 2011, launched several times from VAFB.

* M-16 operations;
* Chemical/biological response;
* Firefighting (J-Fire) PPE utilization;
* DoD and NATO aircraft rescue;
* Firefighting procedures;
* Munitions/explosives response;
* Convoy operations;
* Base-defense techniques;
* Combat skills training;
* Escape and avoidance training; and
* Night combat tactics.

When VAFB military combat firefighters deploy to the frontlines, the remaining team members must protect the homefront with limited staffing. These shortages cause significant operational and support-service stressors. The customers expect the same level of service delivery, and VFD makes realistic adjustments to its response and support functions to ensure uncompromised firefighter safety. The department continually prioritizes its resource investments. For example, training, logistics and fire prevention sections are downsized to augment staffing in the operations section. Work schedules are adjusted to meet mission requirements and to maintain each shift's skill-set balance.

The VFD has three divisions: Response, Readiness and Risk Management. The Response Division's primary function is emergency response and includes shift firefighters; Hot Shots (the only wildland firefighters in the DoD); and the Emergency Communication Center (ECC)—a state-of-the-art emergency information management and disposition hub providing critical first-point interface for all fire, police and medical incidents. This is VFD's E911/PSAP, which provides pre-arrival medical intervention utilizing emergency medical protocols. The ECC also receives all fire detection/suppression system activations; hazardous-cargo movement and hazardous operations information; air-traffic activity reports; road-closure info; water-system status updates; welding operations reports; confined-space operation information; and fire-department capability status updates.

The Readiness Division prepares firefighters to do their jobs and provides any necessary operational resource support. This includes:

Training—Provides proficiency and certification programs for all sections; firefighter and fire-officer professional development through Vandenberg Fire University (see pg. 34); and military wartime contingency training.

Special Operations—Manages agency accreditation status, NFPA 1500 injury-prevention and wellness programs; and NFPA 1201/self-inspection/quality-control program.

Logistics & Acquisitions/Contract Support—This includes all aspects of budgeting, researching, purchasing, inventorying, equipping and supplying firefighters with what they need to get the job done. This also includes ensuring our fire stations, training grounds and fire trainers are inspected, compliant and operational at all times.

The Risk-Management Division provides all compliance/code enforcement and fire-safety engineering for existing and new construction; fire investigation; fire/safety education and media campaigns; work permits; consulting; and public-safety briefings.

VFD miliatry combat firefighters, shown here in the Middle East, deploy all over the world, requiring specialized training.

This C-17 military aircraft transports VFD military firefighters around the globe.

Planning & Training

The VFD mission statement is Serve—Save—Survive. Each of these can be achieved through vigorous training. The department's Training Section

Ready for Anything

Training props help VFD get the job done.—*By Mark Farias*

To provide its firefighters the best hands-on training opportunities, the VFD developed a 25-acre training campus to facilitate skill development and application for live fires, hazmat response and technical-rescue incidents. The campus has been an eight-year work in progress. Today, it has the following components:

* A four-story structural fire trainer built with burn rooms on multiple levels. This prop facilitates search-and-rescue, ladder, ventilation, suppression-system and forcible-entry training.
* A flashover trainer for up-close and personal fire-behavior training under controlled conditions.
* A mobile vehicle fire trainer, which is constructed of steel and utilizes a propane fuel pan for live-fire evolutions. It can be transported to any location.
* A hazardous-product railcar fire trainer.
* A mobile MC-306 tanker fire trainer. (To provide a wide range of hazmat response training scenarios, trainers use the MC-306 tanker, as well as the hazardous-product railcar and structural trainer.)
* A large-frame aircraft fire trainer, a fighter aircraft fire trainer and a rotary-wing fire trainer.
* A three-story vertical and horizontal confined-space trainer and a four-story USAR facility (under construction). These offer firefighters the ability to train on highlines and high- and low-angle situations; building collapse and entrapment scenarios; searching and shoring; lifting and moving heavy structural components/debris; and various trench rescue sites.

VFD's four-story training tower facilitates fire, rescue and forcible-entry training.

Aircraft fire training plays a large part in VFD's readiness plans.

A flashover trainer allows VFD to study fire behavior.

delivers the finest all-risk performance and professional-development services to its firefighters and specialized support personnel. This includes:

* Basic and advanced structural firefighting;
* Emergency medical services (including EMT and paramedic functions);
* Hazmat response for common, acutely hazardous and exotic products and processes;
* Space launch and spacecraft firefighting;
* Wildland firefighting—for which the department developed a Wildland Fire & Dozer Academy;
* Aircraft firefighting and rescue operations for fighter aircraft, large-frame transport and commercial aircraft, rotary-wing aircraft and special operations aircraft;
* Technical rescue for motor-vehicle incidents, railcar emergencies, water-rescue operations, USAR incidents, confined-space

A railcar trainer helps ready firefighters for disasters along the railway on VAFB. Millions of tons of hazmat travel through the base annually.

Ground Control

Blue Card program helps VFD manage its unique hazard zone—*By Mark Farias*

With so many moving parts in so many different places, it was imperative the firefighters of the Vandenberg Fire Department (VFD) improve our hazard-zone management system. Fifty-percent of our department has retired in recent years, and we lost hundreds of years of precious experience. Our current department is very young and has many new faces. Like a lot of departments, we are also experiencing manpower cuts, which has created additional capability challenges on the frontlines and with our support functions.

One of the biggest challenges we faced during emergency response was communication. We needed help with clarity, consistency and conciseness during size-up and reporting and when assigning resources. We lacked a system for developing an incident action plan and establishing command functions. We needed to educate ourselves and standardize our systems in as easy a way as possible. Some crews were *great* at communicating information to responding crews, some did *OK* and some fell a little short. We needed to do better.

Enter the Blue Card Command Certification Program. We are always looking for ways to improve our safety, performance and efficiency, and this program looked like it could fill some of our hazard-zone-management gaps.

As we looked at integrating the Blue Card program into our training and development efforts, it became clear this thoughtful initiative suited any department wanting to improve their safety systems. Our senior staff took the program for a test drive, and the results were unanimous: We needed this program. Our battalion chiefs and training chief became train-the-trainer certified, and we haven't looked back.

As the first Department of Defense fire department to embrace the Blue Card principles, we felt a responsibility to share as much information as possible with fellow Air Force and sister service fire departments. We've already hosted our first Air Force fire department class, and feedback was very positive.

For us, the Blue Card program established a standardized response and safety structure at the task, tactical and strategic levels. Much of the program focuses on communication, which greatly helped us improve our efficiency and effectiveness in initiating, maintaining and controlling incident communications. This has been critical in providing a practical connection between the various management levels of the fireground. The computer-based training, countless radio-reporting exercises and assessment scenarios were essential in building a clear, concise and consistent communication structure for initial radio reporting, standardized conditions/actions/needs reporting and standardized task-, tactical- and strategic-level decision-making. It also played a key role in our efforts to standardize the functions of command, offensive and defensive incident action planning, communication benchmarks and the transfer of command.

At the end of the shift, it's all about getting our firefighters home to their families and friends. This response and deployment system is designed around firefighter safety! We have integrated and adapted the Blue Card program into every aspect of our fire, hazmat, medical and rescue response functions. Another great thing about the program is that it fits every size department, regardless of what their response demands are, and the program can be adapted to meet any agency's needs.

operations, high- and low-angle rescue and cliff-side rescue operations;

* Wartime/contingency training for military firefighters;
* Driver's training program for engines, ARFF vehicles, rescue units, hazmat vehicle, support vehicles and support equipment; and
* Vandenberg Fire University (VFU), which consists of a 12-month firefighter and fire officer professional development program. VFD recognizes that being a firefighter isn't enough anymore. Today's constantly changing environment demands VFD firefighters be armed with a vast portfolio of skils. The VFU curriculum focuses on developing leadership, people and business skills. Derived from the Professional Excellence Model (see image, pg. 35), the curriculum addresses VFD's commitment to developing world-class firefighters through coaching, communication, goal-setting and team-building.

Rocket and missile launches provide VFD a great opportunity to utilize all of their extensive training and preparedness. The department participates in vital preplanning, meeting with all key players. These meetings help facilitate necessary coordination and logistics for nominal launches and really big events. Internally, VFD develops comprehensive incident action plans for staffing and resources, medical needs, tactics and strategies, communications, logistics, weather forecasts, hazmat/special-equipment requirements and key agency contacts.

Tomorrow's Challenges

New missions continue to challenge VFD's skills and abilities. These missions include the X-37 Space Plane and the Space X programs—space-launch platforms that will transport equipment, supplies and astronauts to the International Space Station, filling the void left by the retired Space Shuttle fleet.

The hazardous nature, complexity and national significance of these programs will certainly drive VFD's preparedness and training. Both of these flight vehicles would present extraordinary hazards to firefighters and the surrounding community if a catastrophic event occured. Coordinating and partnering with appropriate agencies will prove critical to the VAFB Fire Department's pre-incident planning for hazards and risk analyses. Securing the specialized equipment and PPE needed for intervention and mitigation will go hand-in-hand with developing an ambitious training program for these new missions. Some elements will be similar to existing launch programs and launch vehicles, but many elements will be unique to these one-of-a-kind space programs. New SOGs are being developed to ensure firefighter safety remains a priority.

At no time in its history have VFD's citizens and customers depended so much on the services it delivers. With personnel reductions, troop deployments, fast-paced tempos and homeland security challenges, VFD firefighters view what they do as not only a responsibility, but a sacred trust. They take seriously their commitment to live up to the highest ethical and professional standards. VFD strives to become even greater than the sum of its parts. This requires continued learning, training and sharing ideas. BS

The über cool X-37 space plane is just one of the programs VFD must prepare for as it faces the future—all while managing the day-to-day needs of its community.

Click this link! Do you work within a military fire department? What challenges do you face? Share your feedback with others in our blog.

Mark Farias, Civ USAF AFSPC 30 CES/CEF, is a 30-year veteran of the fire service and has been the fire chief at Vandenberg Air Force Base in California since 2001. He leads a team of 120 firefighters and specialized support staff that serve and protect "America's Gateway to Space." The department prides itself on its service and response innovation, has won a multitude of Air Force and Department of Defense awards and became accredited through the Commission on Fire Accreditation International (CFAI) in 2009. Chief Farias received his Chief Fire Officer designation through the CFAI in 2006 and has degrees in fire science and management. Chief Farias wrote the book, "Breathing Fire—Unleashing the Leader in You" and is a self-improvement and leadership expert.

How Hot Is HOT?

How heat-release rates can help us gauge thermal hazards.

BY DAN MADRZYKOWSKI

How do you describe a fire? Usually firefighters describe the fire environment by what they feel, such as, "It was the hottest fire I ever fought." But what does hot mean? How hot is *hot*? Fighting or suppressing a fire is, in the most basic terms, an exercise in energy management. The fire generates thermal energy that, when uncontrolled, can be hazardous to people and property. The fire department is called to stop the fire. Typically, this involves the use of water to absorb the thermal energy and extinguish the flames. In many cases, firefighters need to enter the burning structure. The fire transfers thermal energy through their protective gear, which can absorb a limited amount of thermal energy before that energy becomes hazardous to the firefighter. This article presents a brief discussion on what heat release rate (HRR) is, why it depends on ventilation and how we measure it. I'll also present some examples of the HRRs of furniture items and how it all adds up when those items are burned inside a structure. This information should aid in the decision-making process during size-up and risk assessment at your next fire. Do you have the resources you need to safely and efficiently manage the energy a fire generates?

When It Comes to Heat, Size Matters

There are several ways to measure "hot." Typically people think about temperature when they think about how hot or cold something is. Temperature is a measured quantity that describes a material's degree of molecular activity compared to a reference point. But temperature alone does not always provide enough information, because

the rate at which energy is released is also important. For example, the temperature of flames from a small pile of burning wood is about the same as the temperature of flames from a large pile of burning wood. However, the larger pile will have larger flames and more of them, and these flames will release more energy than the smaller pile. The rate and amount of energy released by a larger fire represents a greater thermal hazard than a small fire, even though the temperatures are similar.

A Matter of Measure

Heat is a form of energy. When heat is transferred to a material, such as a gas, liquid or solid, the material's temperature increases. Conversely, when heat is transferred away from a material, the material's temperature decreases. Heat can be measured in Joules (J), calories (cal) or British Thermal Units (BTU). Heat is measured or expressed in terms of the change in temperature to a given mass. For example, 4.18 J is the quantity of heat required to change the temperature of one gram of water by 1 degree Celsius. Similarly, one BTU is the quantity of heat required to change the temperature of 1 pound of water by 1 degree Fahrenheit. Therefore, Joules and BTUs relate energy and mass. How do BTUs and Js relate to each other? For rough estimates, 1 BTU equals about 1,000 J or 1 kJ [1,000 J = 1 kilo Joule(kJ)]. It is important for firefighters to develop an understanding of these values in order to make use of available information.

Heat-Release Rate Explained

The HRR is the thermal hazard generated by fire. As noted by Dr. Vytenis Babrauskas, one of the pioneers in developing a method to measure the HRR of burning items, HRR is one of the key measures for quantifying fire hazard and growth. Click the paperclip at right to download Babrauskas' article, "Heat Release Rate: The Single Most Important Variable in Fire Hazard."

The National Fire Protection Association (NFPA) defines HRR as the rate at which heat energy is generated during burning. HRR is measured in terms of heat per unit time, or Joules per second. One Joule per second is also known as a Watt (W). One thousand Watts equals 1 kilowatt (or 1 kW) and 1 million Watts is 1 megawatt (or 1 MW). We use Joules to measure heat or energy and Watts to measure the HRR, or the "power" of the fire. For example, a kilogram (2.2 lbs.) of gasoline contains approximately 43,700 kJ of energy. That is nice to know, but if you want to know what the thermal hazard is from that kilogram of gasoline, you need to know how *fast* it's burning. If the kilogram of gasoline is consumed by fire after burning at a steady rate for 10 minutes (600 seconds), we can determine that the HRR is approximately 73 kW (43,700 kJ divided by 600 seconds). The faster the gasoline burns, the more the HRR increases. If the same amount of gasoline burns up in 1 minute (60 seconds)—10 times faster than before—the approximate HRR is 730 kW—also 10 times greater than before. If the kilogram of gasoline burns up in just 1 second, the HRR is approximately 43,700 kW. The HRR measurement of things, such as furniture and/or a room fire, allows us to illustrate the physical size of the fire as well as how much energy the fire is producing at a given time in the fire's development.

In 1980, Clayton Hugget, a fire scientist at the National Bureau of Standards, had a technical breakthrough that enabled the determination of HRR from burning, full-scale, real-world objects. He discovered that for conventional organic fuels, such as cotton, wood and gasoline, the HRR is directly related to the amount of oxygen consumed in the combustion process: approximately 13 MJ of energy for every kg of oxygen consumed. This is the basis of oxygen-consumption calorimetry—a way to determine a fire's HRR. In an oxygen-consumption calorimeter (an object used to measure the heat of

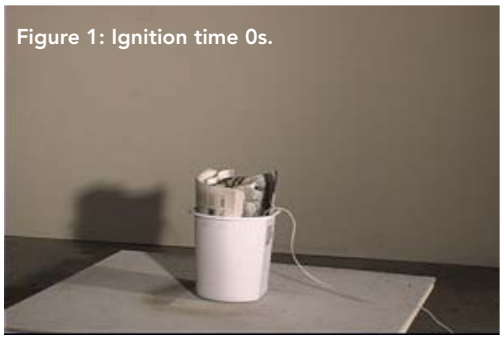


Figure 1: Ignition time 0s.

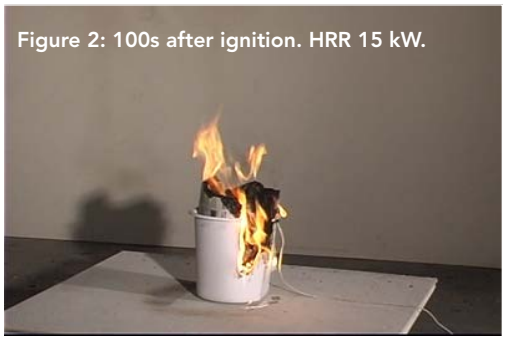


Figure 2: 100s after ignition. HRR 15 kW.

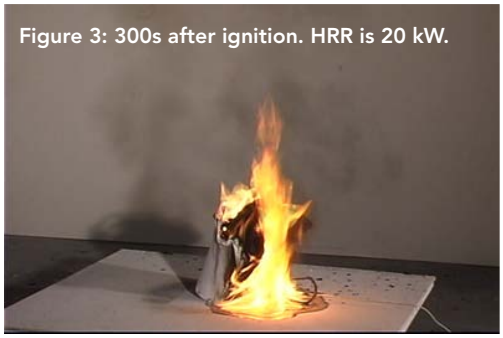


Figure 3: 300s after ignition. HRR is 20 kW.

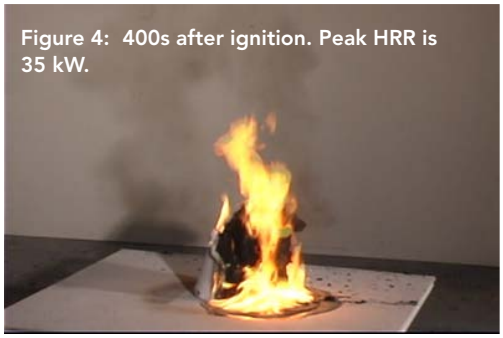


Figure 4: 400s after ignition. Peak HRR is 35 kW.

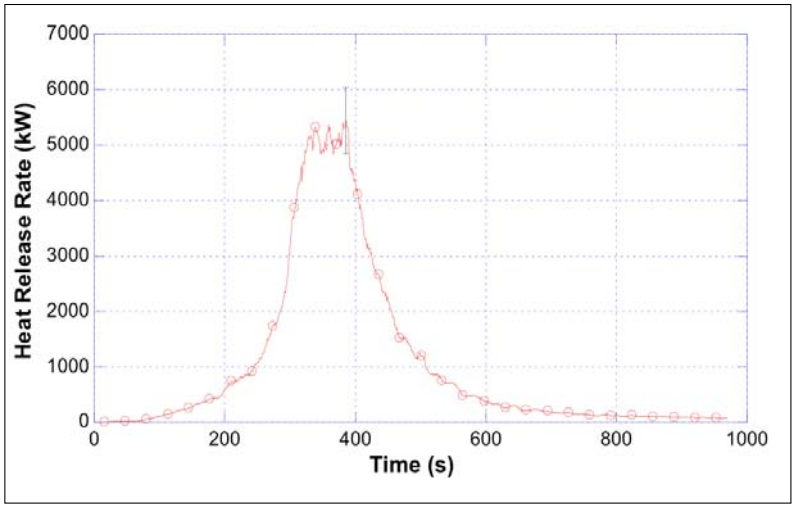


Figure 9: The heat-release rate for the bed fuel package spiked at about 400s.

Figure 5: 100s after ignition. HRR is 110 kW.

Figure 6: 200s after ignition. HRR is 600 kW.

chemical reactions), all of a burning object's combustion products are collected in a hood and flow through an instrumented exhaust duct system, which monitors how much oxygen is consumed. In addition to the oxygen measurements, temperature, pressure, and carbon dioxide and carbon monoxide concentrations are also measured to provide an estimate of the HRR.

How Hot is Hot? A Synopsis of Several HRR Tests

In 2009, the National Institute of Standards and Technology (NIST) conducted several HRR experiments to develop a "gut feel" for what a 50 kW fire looks like and to enable us to gauge the difference between a 50 kW and a 5 MW fire. For the tests, NIST burned items found in a typical residence.

The HRR experiments took place in NIST's large fire laboratory and utilized the 3 meter (9.8 feet) x 3 meter and 6 meter (19.6 feet) x 6 meter oxygen-depletion calorimeters. In the article, we discuss several furniture HRR tests and a structure test in a contents-filled apartment-like structure. The estimated expanded uncertainty was ± 11 percent on the measured HRR. Click here for details on the operation and uncertainty in measurements associated with the oxygen-depletion calorimeter. An error bar representative of the estimated uncertainty for each measurement is given on every data graph. Click here to view the heat-release experiments and the results presented in this article.

Figure 7: 300s after ignition. HRR is 3120 kW.

Furniture HRR

For the furniture HRR experiments, testers used furnishings and items typically found in residential occupancies to provide benchmarks for the amount of heat energy available. The fuel-load components were burned under an oxygen-consumption calorimeter in a "free burn" or "fuel-limited" condition. There are no walls near the calorimeter, and the calorimeter's hood funnels the smoke up and away from the burning item. As a result, there were no compartmentation effects; in other words, there was no impact from the development of a hot gas layer within a compartment, or changes in ventilation to a compartment.

Figure 8: 380s after ignition. Peak HRR of 5400 kW.

1. Trash-Container Fuel Package

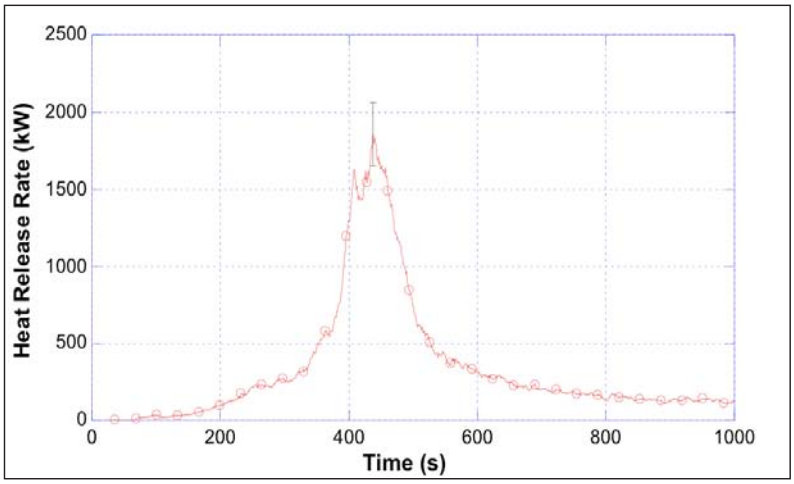


Figure 14: HRR vs. time for the upholstered chair.

Figure 10: 20s after ignition. HRR is 100 kW.

Figure 11: 300s after ignition. HRR is 250 kW.

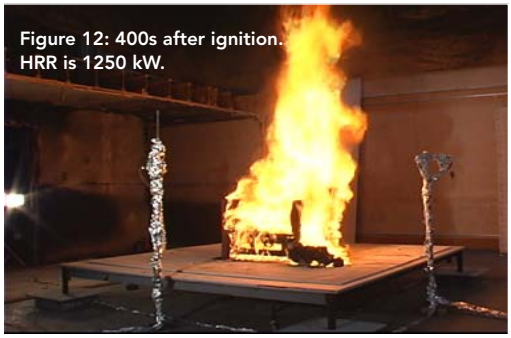


Figure 12: 400s after ignition. HRR is 1250 kW.

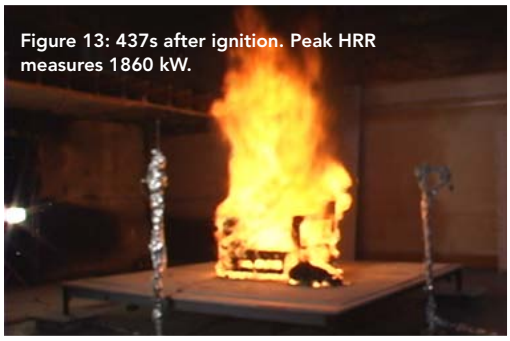


Figure 13: 437s after ignition. Peak HRR measures 1860 kW.

Two replicate experiments were conducted. Figures 1 through 4 show photos of a trash container taken at intervals throughout the HRR experiment from ignition to the time of peak HRR.
The ignition source was an electric match—a book of 20 matches ignited by an electrically heated wire. Testers placed the electric match near the bottom of a 9-quart (8.5-liter) polypropylene waste container with a mass of 0.7 lbs. (0.3 kg), then added approximately 0.7 lbs. (0.3 kg) of dry newspaper. The newspaper was placed on top of the electric match in the center of the waste container. The trash container measured 10.5 inches (270 mm) tall.

The average peak HRR of the waste container and the newspaper was approximately 32 kW for the two HRR experiments conducted. The total energy released for each trash container was 15.5 MJ and 16.7 MJ respectively. The HRR is the amount of energy that is being generated by the fires at a given instant; the total energy released is the amount of energy generated over the entire time is takes to burn the entire fuel package. This represents the total amount of energy released from the fuel package.

2. Bed Fuel Package

The bed used in the experiments was a king-size innerspring mattress on top of a wood-framed box spring. The mattress was composed of a steel inner spring assembly covered with fabric and foam. Based on the manufacturer's tag, the mattress's combustible materials consist of 49 percent blended cotton felt and 51 percent polyurethane foam.

The bed was dressed with a king-size fitted sheet, flat sheet, bed skirt, a comforter, and two standard pillows with pillowcases. The pillow shell was 45 percent cotton and 55 percent polyester. The pillows were filled with 100 percent polyester fiberfill. The rest of the bedding set components were made of 60 percent cotton and 40 percent polyester fabric. The comforter had 100 percent polyester filling. The total mass of the bed fuel package was approximately 191 lbs. (87.0 kg).

The bed fuel package was ignited with a trash-container fuel package placed on the floor next to the bed. Figures 5 through 8 at right show the fire development up to the time of peak HRR, 380

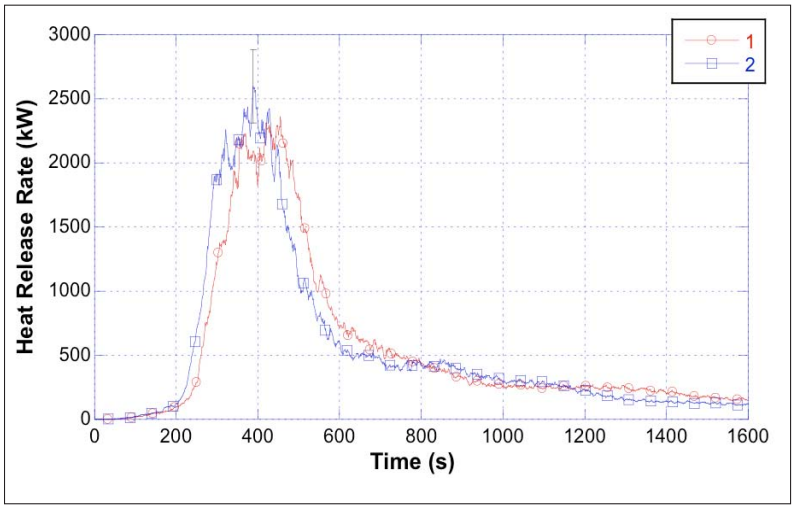


Figure 19: HRR vs. time for Sofas 1 and 2.

Figure 15: 200s after ignition. HRR is 100 kW.

Figure 16: 300s after ignition. HRR is 1220 kW.

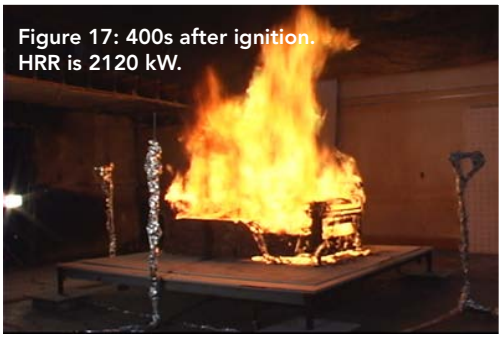


Figure 17: 400s after ignition. HRR is 2120 kW.

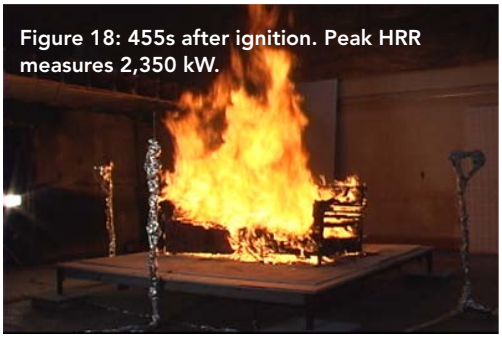


Figure 18: 455s after ignition. Peak HRR measures 2,350 kW.

seconds.

The HRR for the bed fuel package ignited with the trash container fuel package is shown in Figure 9. The peak HRR reached a quasi-steady plateau from 320 seconds to 380 seconds, which averaged approximately 5.1 MW. Total energy released over the entire burning period was 1,000 MJ.

3. Upholstered Chair

The upholstered chair measured 2.4 feet wide (0.72 meters) by 2.5 feet deep (0.76 meters) and 2.4 feet high (0.73 meters). Based on the manufacturer's information, the chairs had a hardwood frame, and the arm and back portions were wrapped with 10 percent blended cotton and 90 percent polyurethane foam. The seat cushion was 90 percent polyurethane foam and 10 percent polyester fiber. The back pillow was 90 percent polyester fiber and 10 percent polyurethane foam. The chair had a mass of 52 lbs. (23.7 kg).

The upholstered chair was ignited with a trash-container fuel package positioned adjacent to one side of the chair, as shown in Figure 10. Figures 10 through 13 show photographs taken between 200 seconds and 437 seconds after ignition. Figure 13 was recorded at the time of peak HRR, 437 seconds after ignition. The HRR for the upholstered chair is given in Figure 14. The peak HRR of approximately 1860 kW occurred 437 seconds after ignition. Between ignition and 1000 seconds after ignition, 330 MJ of energy was released.

4. Sleeper-Sofa Fuel Package

The sleeper sofa measured 6 feet wide (1.83 meters) by 2.5 feet deep (0.75 meters) by 2.7 feet tall (0.83 meters). Two sofas were burned. The first sofa had a total mass of 182 lbs (82.7 kg) and the second sofa had a total mass of 175 lbs. (79.7 kg).

The sofa had a wood frame surrounding a metal foldout sleeper mechanism and foundation. The sleeper mechanism housed a thin, folded inner spring mattress, and the seat cushions sat on top of it. The frame was covered with a polyester-based fabric. The wood framing in the sofa's arms and front portion were covered with thin layers of polyurethane foam and polyester batting, then they were upholstered with fabric. The back cushion area was also part of the fixed wood-frame assembly. Polyurethane foam padding was installed over

the metal spring supports and covered with polyester padding and upholstery material. Each sofa had a thick inner spring mattress and two seat cushions. The cushions had a core of polyurethane foam, which was covered with polyester batting in a polyester fabric cover, similar to the upholstered chair seat cushions.

Both of the sofa experiments used the same ignition scenario: An electric match was placed at the intersection of the seat cushion's rear corner, an arm and the back cushion's lower corner. Figures 15 through 18 shows photographs taken between 200 seconds and 455 seconds after ignition. Figure 18 was recorded at the time of peak HRR—455 seconds after ignition. Figure 19 shows the HRR curves for two similar sofas (1 and 2). The peak HRR for Sofa 1 was 2.4 MW at 455 seconds after ignition. The peak HRR for Sofa 2 was 2.6 MW at 389 seconds after ignition. The trend and general shape of the sofas HRR were quite similar. The total heat released for each sofa was approximately 864 MJ and 842 MJ.

Furniture Heat Release Rate Results

The HRR experiments were conducted to characterize the ignition source and the upholstered furniture items. The average peak HRR of two trash container experiments was 32 kW. The upholstered chairs had an average peak HRR of 1.8 MW. The bed fuel packages had an average peak HRR of 4.3 MW. The sofas provided an average peak HRR of 2.5 MW. The peak HRR for each of the furnishing items occurred between 380 seconds and 455 seconds in these free-burn experiments. The upholstered-furniture fuel packages, when installed in a small room (16 feet by 12 feet by 8 feet or less) with interior finish fuels and wood furnishings, can generate and sustain post-flashover conditions provided the required oxygen is available.

Structural HRR Experiment

For the structure HRR tests, researchers built a structure representing an apartment inside the NIST Fire Research Facility under the 30 feet (9 meter) by 40 feet (12 meter) oxygen-consumption calorimetry hood. The structure had three rooms connected by a hallway: a bedroom, a living room and a second bedroom behind a closed door. A door from the living room led to a corridor that extended 24 feet (7.3 meters) in each direction when measured along the inside of the exterior wall. The south side of the corridor was closed with no exit. The north side of the corridor had an exit vent on the ceiling, which led to an insulated exhaust chimney that vented into the oxygen-consumption calorimetry hood. The only other opening in the structure was the bedroom window, which was vented during the fire experiment.

Testers used furnishings similar to those used in the furniture HRR experiments described earlier in this article. The fire started in the bedroom, which had a king bed fuel package and two upholstered chairs in addition to some wood furnishing as shown in Figures 20 and 21. A trash container placed between an upholstered chair and the king bed provided ignition. The total mass of the furnishings, carpeting and carpet padding in the bedroom fuel package was 894 lbs (406 kg). Based on metal removed after the experiment, the combustible mass of the bedroom fuel package was 769 lbs. (350 kg). Taking those totals and dividing by the floor area of the bedroom yielded total and combustible fuel loadings of 4.7 lb/ft^2 (22.8 kg/m^2) and 4.0 lb/ft^2 (19.6 kg/m^2), respectively. Adding the peak HRR from the king-bed fuel package and two upholstered

Figure 20: Bedroom furnishings, looking north.

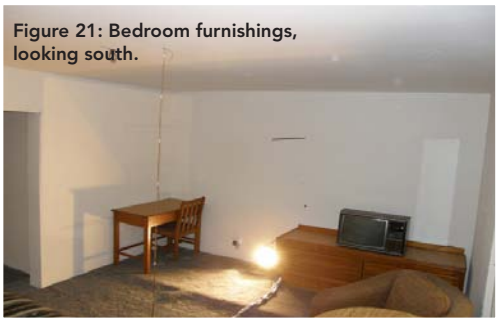


Figure 21: Bedroom furnishings, looking south.

Figure 22: Living-room furniture, looking north.

Figure 23: Living-room furniture, looking east.

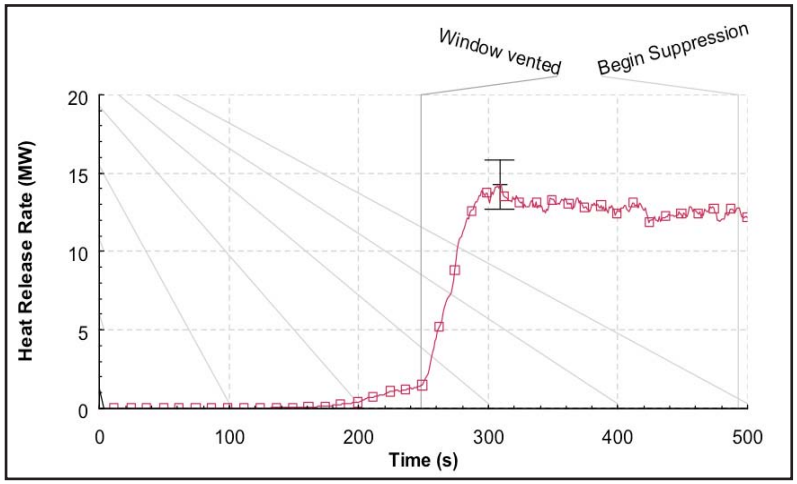


Figure 26: HRR vs. time, Structure HRR experiment.

chairs equals more than 7.8 MW. This value did not include the HRR from the carpeting, subfloor, or the painted gypsum board walls and ceilings.

The living-room fuel load and its arrangement are shown in Figures 22 and 23. The room's main furnishings included three upholstered chairs and a sofa. The total mass of the furnishings, carpeting and carpet padding in the living room was 558 lbs. (254 kg). Based on the heat-release experiments for the sofa and three upholstered chairs, the potential average peak HRR of these furnishing together is also approximately 7.9 MW. Again, this did not include the subfloor or the painted gypsum board walls and ceilings. All together, the installed combustible fuel load for each structure fire test was approximately 590 kg (1,300 lbs.).

Figure 24 (right) shows the structure fire as the window began to fail due to flame impingement; the HRR at this point was approximately 1 MW. Note that the amount of oxygen available for combustion in the structure had reduced since the time of ignition, and the amount of unburned fuel had filled the structure. Figure 25 (right) shows the fire condition after the window was vented. At this time, both the bedroom and the living room had thermal conditions consistent with post-flashover.

Figure 26 (above) shows the HRR time history for the structure. The measured HRR was zero for the first 150 seconds after ignition because the heat generated by the fire up to this point was contained within the experimental structure. After 150 seconds, the combustion products throughout the structure had developed a hot gas layer, and combustion products began to flow from the corridor vent into the oxygen-consumption calorimeter. As the flow from the vent increased, the HRR slowly increased to 1.5 MW. After the window was vented, the HRR increased from approximately 1.5 MW to 14 MW in less than 60 seconds. The HRR held steady between 12 MW and 13 MW for almost 180 seconds, then testers initiated suppression.

Figure 24: Structure fire just prior to complete venting of the bedroom window.

Figure 25: Structure fire after venting of the bedroom window.

Conclusion

The HRR data from the limited experiments presented here show a range of HRR from furnishings found in a residential structure. The photographs are intended to provide a sense of what a 2 MW fire or a 4 MW fire look like and how that might generate an unten-

able thermal environment inside a room in a house. One or two pieces of this furniture have sufficient energy to flashover residential scale rooms, provided that the oxygen supply is sufficient.

These experiments, including the structure fire experiment, only present the HRR from the contents. Given the significant amount of fuel and potential energy available in furnishings and interior finish materials in a typical household, it is likely that a fuel-rich condition will occur. As a result, horizontal ventilation will increase the HRR of residential structure fires, as seen in the structural HRR experiment. The rapid increase of HRR as seen in the residential structure experiment might represent a significant thermal hazard to firefighters if they are inside a structure when the rapid increase occurs. Sudden or unexpected changes in thermal conditions have been reported in many injury or fatality reports.

Rapid or sudden increases in HRR can also occur in commercial fires. As noted in the NIST Technical Study of the Sofa Super Store Fire, the energy content of the furniture in the showroom and the loading dock areas was approximately 610 gigajoules or 610,000 MJ. (Click here to view the study.) This is equivalent to the energy content of about 5,100 gallons of gasoline.

All firefighters must understand the concepts of temperature, heat, energy content and HRRs as a basis for understanding the fire conditions and thermal hazards they experience every day. Consideration of the energy content, HRR and how fast the HRR can increase with a change in ventilation can assist a firefighter with preplans, size-up and tactics in order to minimize their exposure to thermal hazards. BS

Click this link! Will the information in this feature affect the way you size-up or attack fire? Share your opinions in our blog.

Daniel Madrzykowski is a fire protection engineer with the National Institute of Standards and Technology in Gaithersburg, Maryland. He has a master's degree in fire protection engineering from the University of Maryland and he has conducted research and investigations to improve firefighter safety. In 2009 received the ISFSI/Fire Engineering Instructor of the Year Award. Dan is a Fellow of the Society of Fire Protection Engineers (SFPE) and currently serves on the NFPA Technical Committee on Fire Service Training.

The Secret of NIMS

Info on NIMS, local ICS & how they can (& should) work together.

BY B SHIFTER STAFF

ILLUSTRATIONS POONEY PICKERING

NIMS was developed to manage large-scale, long-term events.

One of the recurring questions surrounding the Blue Card Hazard Zone Management System is, "Is it NIMS compatible?" The short answer is yes. We believe Blue Card is NIMS' best friend, particularly when it comes to structural firefighting operations or any incident with a hazard zone. In fact, there are many emergency-response professionals who believe Blue Card provides a much higher level of command and control, firefighter safety and operational flexibility whenever firefighters are operating in IDLH conditions (immediately dangerous to life and health).

The current version of NIMS (the National Incident Management System) was signed into federal law by Homeland Security Presidential Directive 5 in 2003. Both NIMS and the National Response Plan were designed to connect firefighters, camp cooks, mobile laundry units, law enforcement, weather specialists, the Department of Housing and every other incident resource under the umbrella of a Type 1 overhead team for large-scale, widespread events.

NIMS' intent is not to dictate to the fire service how to execute a fire attack for Mrs. Smith's kitchen fire. When the baker for the food unit of a NIMS Type 1 team is

demobilized and returns to her neighborhood bake shop, does she use NIMS to take care of her day-to-day business? No, she does not, and the federal government doesn't expect her to. When she is activated for the next Type 1 event, she will once again fit into the NIMS organizational chart. It's the same for fire departments. We have spent the last four decades developing the systems, policies and procedures we use to manage our day-to-day service delivery. It probably wasn't the federal government's intent to have us abandon the systems we use to manage more than 99 percent of our incident activity in the unlikely event we respond to an incident that has flying tankers.

We need a strong, consistent system to manage the events we encounter every day.

Getting Ready for the "Big One"

In 1972, FIRESCOPE (Firefighting Resources of Southern California Organized for Potential Emergencies) developed incident command when raging wildland fires had extended into residential neighborhoods, destroying hundreds of homes and causing multiple fire deaths. Local fire departments had to work together to build a communication and deployment system that connected multiple fire departments at the scene of this large-scale natural disaster. This project also produced an organizational ICS matrix that identified and divided the management positions for these large-scale incident operations

In the 1980s, the National Wildfire Coordinating Group (NWCG) was formed to provide national leadership and to establish, implement, maintain and communicate the policies, standards, guidelines, and qualifications for wildland-fire program management. This federalized the incident command system (ICS) into the National Interagency Incident Management System (NIIMS).

ICS was created to manage *gigantic* incident operations spread over miles, requiring thousands of incident responders and taking days, if not weeks, to control. Federal-level NIMS Type 1 and 2 incident operations require building the logistical infrastructure to support long-term incident operations. This takes days to mobilize and set up. Essentially, it means establishing a civilization in a remote area experiencing a large problem (a forest fire spread across three states, for example) or in urban areas that have been hit with natural or man-made disasters. Due to the scope of the disaster, these areas have lost the infrastructure necessary to support the community.

Our local IMS should help us "divide and conquer" incident operations with the resources we have available.

Local Ops Left to the Locals

Day-to-day operations were (and still are) left up to each local fire department, which remain their own sovereign nation until some major disaster visits the response area and everyone shows up to play their parts in the large NIMS organization. Just as important as having a routine to manage the "big one," we need a strong system for local hazard operations. The lack of a strong system is a recurring theme in every firefighter line-of-duty death report.

Right around the time FIRESCOPE was developing and refining its operations, Alan Brunacini gleaned many of its practices, policies and systems to create SOPs for the local, smaller-scale incidents fire departments handle on a daily basis. Today, these local fire-department operations are categorized as NIMS Type 4 and 5 incidents. Brunacini's initial effort became the operations manual for the 25+ plus fire departments that protect Maricopa County, Ariz. In 1985, Brunacini used the operational experience gained from the actual application and refinement of these comprehensive SOPs to produce the first edition of the "Fire Command" textbook and the Fire Ground Commander Journal, which the NFPA originally distributed.

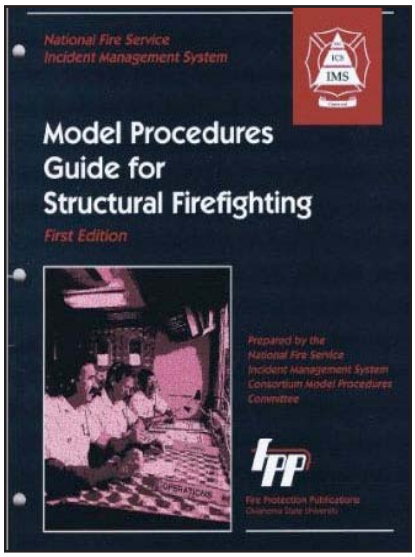
IMS Is Born

In the early 1990s, the National Fire Incident Management System Consortium (NFIMSC) was formed to develop a common approach to local incident command. NFIMSC worked to merge Brunacini's Fire Ground Command (FGC) system with FIRESCOPE's Incident Command System. The effort involved 23 major fire service organizations, including FIRESCOPE, the Phoenix Fire Department, the National Fire Academy, the International Association of Fire Chiefs (ICHIEFS), the International Society of Fire Services Instructors (ISFSI), the Emergency Management Institute, the U.S. Coast Guard, and IFSTA/Fire Protection Publications, among others. The merger was achieved through a consensus process representing the American fire service.

Taken from: http://www.fema.gov/txt/nims/nims_ics_position_paper

Recognizing the continuing challenges occurring in the fire service in applying a common approach to incident command, the National Fire Service Incident Management System (IMS) Consortium was created in 1990. Its purpose was to evaluate an approach to developing a single command system. The consortium consisted of many individual fire service leaders, representatives of most major fire service organizations and representatives of federal, state and local agencies, including FIRESCOPE and the Phoenix Fire Department. One of the significant outcomes of the consortium's work was an agreement on the need to develop operational protocols within ICS, so that fire and rescue personnel would be able to apply the ICS as one common system.

In 1993, the IMS consortium completed its first document: Model Procedures Guide for Structural Firefighting. As a result, FIRESCOPE incorporated the model procedures, thereby enhancing its organizational structure with operational protocols. These changes enabled the nation's fire and rescue personnel to apply the ICS effectively regardless of what region of the country they were assigned to work. The National Fire Academy (NFA), having already adopted the FIRESCOPE ICS in 1980, incorporated this material into its training curriculum as well.



In the 1990s, the NFIMSC developed guidelines for local incident command.

Credentials & Certification with Local Needs in Mind

NIIMS was originally developed to manage large wildland and forest fires. The system includes a large aircraft-management capability along with a tactical model organized around 12-hour work cycles in the great outdoors.

Over time, NIIMS was refined to credential and certify each incident responder for their specific job responsibilities. Credentialing the incident responders in this fashion helped to standardize incident operations. This credentialing system became known as "Red Card." Training and continuing education are required to maintain Red Card certification.

Within our own service, the tactics for fighting an apartment fire may vary significantly from department to department. Thirty years ago, the leading West Coast experts on ladder-company operations disagreed with their East Coast counterparts about the appropriate ventilation techniques for buildings with the same type of roof. This continued for years until someone realized the building codes in earthquake country had a major impact on the fire performance of a roof structure. West Coast roofs held up a lot longer when exposed to fire due to the more robust construction methods dictated by earthquake building codes.

This same tactical confusion is currently playing out with the newest fire research from NIST and UL. The American Fire Service's tactical approach is traditionally based on the legacy-style construction methods that have existed since the mid-1770s. The tactical paradigm began to change in the late 1960s with the lightweight building boom that fueled the population expansion west

of the Mississippi.

A set of tactics designed around buildings constructed with 2" x 8" nailed lumber do not work for today's detached, single-family residences built out of 2 X 4s, OSB, glue-based attachments/connectors, Styrofoam, chicken wire and stucco. It causes nothing but confusion when we apply a very narrow tactical approach to the diverse buildings that make up modern America.

Fire departments must be able to customize their tactical approach based on the operational realities they face everyday. Each department's composition, along with the hazards they face, varies from region to region. Urban fire departments with four- and five-person staffing may mandate the use of 2 1/2" hoselines for initial attack. This is not a viable option for fire departments that staff their companies with three people. The Blue Card certification lab allows a fire department to customize their tactical approach and corresponding tasks that work best for them.

Fire departments need strategies and tactics specific to their unique fire challenges.

Local ICS Ensures Safety

A fire department does its best work when it shows up to the scene and acts like a fire department. Our work requires operating in hazard zones with an IDLH atmosphere. The system we use to manage these incident scenes must ensure the safety and survival of the responders. Incident scenes that contain a hazard zone require the incident commander (IC) to simultaneously manage:

Strategy & Tactics—These are the local policies, procedures and preferred methods we use to conduct our local structural firefighting operations. We use a standard routine and approach based on a set of critical factors that includes the building; occupancy type; construction; and the size, extent and location of the fire. The critical factors represent the conditions. We match our actions to these conditions, and the actions dictate the tasks we perform. This includes managing water, ventilation, and all the other work that help us achieve the tactical benchmarks of "all clear," "under control" and "loss stopped." These completed tactical benchmarks represent the standard incident outcome.

Command—The IC uses the incident management system to control the position and function of all hazard-zone resources. For structure fires, all hazard-zone communications occur over a single tactical radio channel. The IC makes all hazard-zone assignments and builds an effective incident organization around tactical-level needs and requirements. The local command routine will be based on response and arrival order, staffing, available resources and the aide agreements between neighboring departments.

The video above shows how much faster and hotter new furnishings burn.

Safety—We take command from the onset. We match our actions to the conditions, provide strong tactical control and maintain an instantly deployable tactical reserve anytime we operate in a hazard zone. The strategic, tactical and task levels of the incident operation all have safety responsibilities and routines. We use the system to align and connect these levels to keep the operation both safe and effective.

The System Should Match the Work

Today's structure fire looks and acts more like a hazardous materials incident operation. The old 20-minute rule that we've used to gauge how long we can stay in a building hosting an out-of-control fire is a couple of decades out of date. The lightweight building materials and construction methods react much more violently than traditional, legacy building systems and the Class A fuel loads of yore. Click the video above right to watch a comparison of the

modern residential fuel loads vs. old-school, Class A contents.

The Blue Card program is based on the second edition Fire Command curriculum package ("Fire Command" textbook, workbook and instructor's guide, nine DVD video series and "Command Safety" textbook). The program is designed so fire departments can match their local incident operations to the hazards they deal with on a daily basis. It also helps them design their operational systems around their staffing, resource levels, response times and any aid agreements with their neighbors.

The Blue Card program was initially launched in 2009. The online program uses dozens of structure fire simulations to describe, illustrate and explain the required hazard-zone management elements, the associated strategy and tactics and the necessary safety requirements for structure fires. The occupancy types covered include houses, apartments, strip malls, commercial buildings and big box structures. During the first 12 months, members from more than 100 fire departments went through the Blue Card program. This sampling of fire departments ranged from Australia to Alaska and Hawaii to Florida. The biggest input concerning the program was that it lacked content for residential basement fires (a big issue in the Midwest). Although the program was only 1 year old, it was obvious that a revision was in order.

Blue Card Version 2, introduced in 2011, includes a comprehensive overview of the critical factors associated with fires in residential basements. The functions of command were also rearranged to facilitate delivering the teaching package. The revised content was the product of sitting down with the subject matter experts (firefighters) to make the necessary revisions and additions to the program.

NFPA 1561—The Standard on Incident Command

It shouldn't come as surprise that the incident command standard is part of the larger firefighter safety standard—NFPA 1500. Effective incident command is the foundation for safe incident operations. It should also come as no surprise that "Fire Command" is listed as a reference document for NFPA 1561. Just as the Blue Card system has been designed for fire departments to customize to their own needs, NFPA 1561 and the companion Professional Qualifications 1026 offers the same local flexibility. NFPA 1561 states:

4.3.2 This standard shall not restrict any jurisdiction from exceeding these minimum requirements or from adopting a system tailored to meet local needs while satisfying the minimum requirements of this standard.

4.4.2 The incident management system shall be designed to meet the particular characteristics of the incident based on its size and complexity, as well as the operating environment.

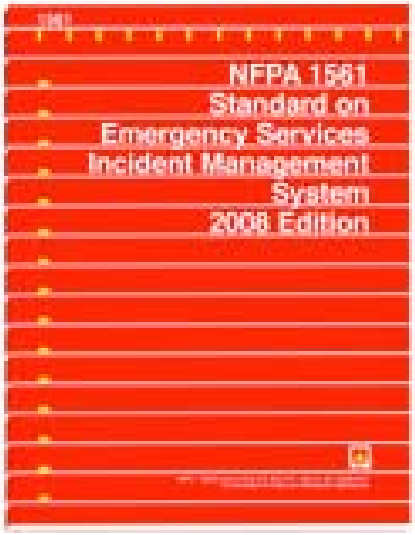
Chapter 1 of NFPA 1026 refers to the powers of the authority having jurisdiction (AHJ). AHJ powers include:

Section 1.3.1—"The job performance requirements shall be accomplished in accordance with the requirements of the authority having jurisdiction (AHJ)..."

Section 1.3.2—"The AHJ shall establish a specific qualification process that identifies the steps to prepare a candidate for qualifications at the level the candidate will be expected to perform under the auspices of that jurisdiction and to prepare the candidate in a manner consistent and compatible with NIMS.

Section 1.3.7—Wherever in this standard the term rules, regulations, procedures, supplies, apparatus and equipment are referred to, it is implied that they are those of the AHJ.

Based on NFPA standards, each local fire department has the power to customize their incident management system to meet the unique needs of



NFPA standards state that local fire departments can and should develop systems to manage local events.

their local department along with the hazards they face. This customization must meet the minimum requirements of the standard and be *compatible* with NIMS (not identical—compatible). The 1026 document goes on to say all definitions of "rules, regulations, procedures, supplies, apparatus and equipment" are left up to the AHJ. There are major differences between managing a large natural disaster with 12-hour work cycles and the SCBA-imposed, 15-minute work cycles that comes with the IDLH atmospheres found at the scene of every structure fire. The NFPA recognized this and gave the local AHJ the ability to customize a system that meets local needs based on local hazards.

NIMS & Blue Card: You Don't Have to Choose Just One

When you read both NFPA 1561 and 1026 it becomes obvious that Blue Card meets or exceeds any part of these standards intended for structural firefighting. Blue Card training complements and supports NIMS training. It isn't a choice of one or the other. Fire departments that use the Blue Card system have also gone through the required NIMS training. Nothing in Blue Card conflicts with NIMS. During the last several years, there have been more and more Red Card members that have gone through the Blue Card program. Their overwhelming response has been that Blue Card supports NIMS. In the last several years, FEMA has been awarding firefighter training grants for fire departments to conduct Blue Card training.

FEMA looks at three broad categories when awarding firefighter educational grants: 1) Can the program be completed in one year? 2) Does it lead to regionalization (working closer with your neighbors)? and 3) Can a fire department quickly take over managing the program? In regard to Blue Card, the answer to all three questions is yes. That is why many departments have been using FEMA grants to secure funding for Blue Card training and certification for NIMS Type 4 and 5 incident operations. The program is designed to the most rigid upper educational standards. This is why several accredited schools and universities are offering up to seven upper-division educational credits for individuals who have successfully completed the Blue Card Train-the-Trainer program.

The safety effect of the Blue Card system is rooted in its "Fire Command" heritage. "Fire Command" is a reference for OSHA state law. Canada and Australia also recognize "Fire Command" (and Blue Card) as a best standard practice. ICHIEFS' Great Lakes Division and its Safety, Health and Survival section, along with ISFSI, endorse the Blue Card program. The most recent organization to endorse the Blue Card program is the Center for Public Safety Excellence (CPSE), the same organization that accredits fire departments.

The final word goes to the users. The following comment comes from a battalion chief in a busy Southern California fire department: "As a 29-year veteran, this is the first training course in a very long time that I truly see and feel the value and benefit of. It makes my performance as a battalion chief safer and sounder, and I have more confidence. I am actually excited to get to the computer each night and see what the next few hours have in store. The information just keeps gets better and better." BS

Culture Clash

Reader responds with advice for a NICE, new chief in a tough, strange world. Plus new reader feedback case study & FREE personnel problem simulation!

BY ALAN V. BRUNACINI

In the last issue, we shared a case-study about a new, forward-thinking chief who had just started working in a medium-size, urban department with an archaic management style (click the paperclip to download last issue's scenario). We invited readers to submit a solution to the problems outlined in the case study. Congratulations to Dennis Heinrich. We selected his submission, printed below, as a good example of how to tackle the probelems presented in last quarter's column. Please click Bruno's picture at right to hear him discuss Chief Heinrich's response.Please check out pg. 52 to read our latest case study. (Share your proposed solution with is and you could win a free T shirt.)

Click the image above to hear Bruno's response to our case study.

New this issue! A free online personnel-problem simulation. Each quarter, we will provide an interative component to our latest case study to help drive home the functional boss behaviors message. Click the yellow star at right to launch the sim. Good luck, and have fun!

Case Study No. 1 Response: The Punisher

Our new chief, let's call him Bill, faces a daunting task. His new department lacks internal and external innovation (progressiveness) and is nonproductive. This results in reduced service to customers. Bill's challenge as the new fire chief is to manage a change in culture, leadership style and management methods with an end goal of creating high-quality performance outcomes for the department.

Bill should start with the organization's culture, which provides the foundation for everything else. He should work toward replacing the passive-aggressive and defensive environment with a constructive, encouraging one that highlights achievement and self-actualizing.

Many people confuse true leadership with "positional" leadership, which is simply having different responsibilities and roles. True leadership is the ability to influence positive organizational outcomes. Bill needs to transition the culture from a "transactional" reward-punishment one to a "transformational" one with self-managed crews and individaals. This requires engaging with others and building relationships, which increases everyone's identification with the organization, and raises motivation and commitment levels in both followers and leaders.

Next, Bill needs to work toward changing the management style. The current assistant chiefs manage in a primitive, exploitative and authoritative way, which relies on power, obedience, personal dependency and subsistence.

This style is not about the "work," but about personal egos. Since the line and staff are accustomed to this environment, any adjustments will prove difficult. Therefore, Bill should initiate change in steps. He should first move to a consultative/supportive style that depends on leadership and motivation. Second, he should encourage a participative environment that depends on mutual contribution, integration and teamwork, responsibility, self-discipline, self-realization, enthusiastic performance, and commitment to task and team.

Bill's 100-Day Solution

Massive change at the very beginning is not change—it's confrontation. Bill should get the lay of the land first, gather data, and most importantly, model the behaviors that he desires in others.

1) Bill should identify what was so special about his previous department. What values and norms seemed important to Bill and the other members? These are the values his new department will hold true under his leadership. Bill's next task is to develop his vision for the new department as a model of quality community service. He should identify performance measures and quantify them. Humans have a strong desire to be rational—rational in the sense that something is logical, objective and takes into consideration all the information. This is where numbers come into play (numbers are objective). It's irrational to argue against clear, concise numbers. Performance measures might include: department and crew community-service effectiveness, growth (departmental as well as individual), innovation (internal and external progressiveness), cost efficiencies, and member satisfaction.

2) Bill should discuss his vision and goals with his staff. He should identify those who are willing to change their behavior and those he will need to cull from the department. Influential, powerful individuals who are unwilling to change eventually become rebellious and toxic. In dealing with the predictable resistance, Bill should initiate a good training program to help individuals realize that ignorance is not bliss, but simply not knowing. Once they know what is possible and what is in the best interests of their community, they might come on board. If not, it's time to let them go.

3) To encourage buy-in, Bill should deliver in person a message to the rank and file. It can start with something like this:

"I realize many of you are unfamiliar with me, and I hope to change that as we become great friends and colleagues. My goal is to establish our department as an example of high-quality community service. Quality is a combination of effectiveness, efficiency and competence. This is where the rubber meets the road, and our firefighters' actions reflect on our department and develop our reputation in the community.

In today's world, if we are standing still, complacent and seeking the status quo, we will fall behind. I want you to challenge the status quo and reimagine our work. New ideas challenge old ways of thinking. New ideas are uncomfortable, but we are up to the task.

I believe that a constructive, mature, collaborative environment with committed individuals is the path to this vision. None of us is as smart as all of us. Collaboration requires great trust, openness and competence.

To help this transition happen smoothly, we will initiate a training program to educate everyone about our goals. Do you have questions or concerns?"

4) Bill should direct the training department to analyze training needs and design and develop a program for line and staff on the different types of culture, leadership and management and which styles you desire for the department.

5) Bill should develop and establish an "all-hands" communication method to deliver the positive, constructive outcomes of the changes. He

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should discuss with the staff and line levels what they see as the positive outcomes of the new vision and training. Based on this discussion and evaluation, he should make adjustments to the training.

If the stars align and Bill creates a well-thought-out education and training program, he takes the "daunting" out of task, and the department evolves into an organization that delivers high-quality performance outcomes for the community it serves.

Spring 2012 Case Study: Defensive Denial

You are the operations officer (deputy chief) of a busy, midsize urban fire department that protects an older, industrialized city with a lot of structural fires. Department members pride themselves on being aggressive and habitually performing interior attack operations. This consistently offensive approach has produced a risk-taking culture that teaches young members that inclusion and acceptance depend on their enthusiastic participation in active, attack-from-the inside operations. The excitement of pushing the safety system to its outer limits proves very attractive to younger members. The drama of doing quick, dangerous offensive work appeals to their typical "young man's invincibility syndrome."

Click the image above to hear Bruno explain this quarter's new case study.

One outcome of consistently (and instinctively) attacking poorly evaluated interior fires is that your department's injury rate is high, and many of the injuries are serious. Through the years, the department has experienced a comparatively high rate of line-of-duty deaths. Many of the serious injuries and fatalities occurred while firefighters were involved in interior operations that put them in offensive positions under defensive conditions.

You have tried to expand and improve how your officers conduct the local, everyday incident command system. You are greatly concerned with your members' inability to evaluate tactical conditions, choose an appropriate overall operational strategy that matches those conditions, and command and control operations within that strategy.

Your members seem unwilling to discuss defensive strategies with an open mind—or even admit the defensive mode exists. They believe conducting exterior operations is an admission of failure and defeat. In their opinion, the only legitimate reason to operate on the outside is if interior fire conditions have driven them out. To them, offensive ops are the only initial-attack option. Aggressively operating in the offensive mode seems have been ingrained with the power of a post-hypnotic message.

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You have started to present training material that shows a 10-scale range of tactical conditions, from "nothing showing" to "almost completely burned down." You have used that same tactical-severity scale to lead the discussion (and hopefully the lesson) about how we can and must develop an overall incident strategy for each condition along that scale.

You have tried to explain that pairing/connecting the conditions with a strategy is based on standard scientific principles (chemistry and gravity), and that we must choose our strategies based on those principles. When the hazard level (thermal/toxic/collapse) exceeds the safety system's capability, the only option is to exit the hazard zone quickly and set up defensive operations that protect exposures from outside the collapse zone. You reinforce the message that it is a lot smarter and less painful to get out 5 minutes early rather than 5 minutes late. Many of the classes become emotional shouting matches, where you hear things such as, "What ever happened to real men!" on one side and "You are an idiot if you let a burning building kill you!" on the other.

These meetings illustrate the strength of the culture that drives the troops to go offensive from the start and stay that way until 1) the fire goes out or 2) it forcibly evicts them from the inside.

You understand that developing strategic versatility conflicts (!) with the department's highest held (and very personal) tradition—going into the hazard zone and directly engaging "the enemy." You are contemplating how to conduct a sensible discussion and examination of this attack approach. You must do this in a way that is considerate of your department's historic operational culture.

Your assignment: Please develop a management/leadership plan to review current strategy-management procedures and practices, and then make recommendations to modernize them. Outline the functional boss behaviors you must personally engage in to lead this effort. You are certain (and concerned) that if some operational changes are not made, the fires in your highly combustible, heavily fire-loaded local buildings will continue to injure and kill your firefighters. You would rather be a beat-up change agent than a broken-hearted pallbearer.

Please send your response to editorial@bshifter.com, writing FBB in the subject line. Deadline for submissions is June 15, 2012. Remember, we can't win if you don't play. If your response is chosen, you win a cool T-Shirt. BS

Editor's Note: Historically, columns requiring reader feedback have fallen a bit flat. Readers seem shy about responding. They're too busy. They don't think they have anything smart to say, or maybe they just don't want to participate. We ask that you set aside your trepidation and dive right in. Any response will be welcome and insightful and will allow other readers to learn from your experiences and opinions. We will not print your name or your department's name if you request that we keep your info private. And remember, you can win a cool T-shirt if we choose your response.

The Hazard Zone at Home

Managing sticky situations improves our reputation.

BY CHRIS STEWART

Hello, B Shifters. My name is Chris Stewart, and I am a new columnist for B Shifter magazine. In each issue, I will address the challenges we face inside and outside the hazard zone. The information and stories I will use here are based on my experiences as a company officer. For the most part, I have been able to manage most of these difficulties successfully. Some situations left me beat up a bit, but I was certainly made me better for it.

I have spent the past 20 years in a large, metropolitan fire department with a long and storied history on the forefront of hazard-zone management. I've known since I started my career that the department expects much from its company officers (the captain in my world). Company officers must manage the most critical moments in the hazard zone with little discretionary time and primarily without supervision (hopefully this occurs in a well-defined fireground system). We are trusted with our crews' welfare for each shift. Company officers essentially have ownership of their "franchise," including the performance and attitude of their firehouse, company and crew.

Since my initial recruit training, emphasis has been placed on operating safely and effectively in a working hazard zone, e.g. fire or rescue scene. The hazard zone is managed within a risk-management model, and the vast majority of our training time is spent refining our application of this model for the street. But how much time have we spent training on—or even thinking about—our personal/crew/organizational risk within the firehouse and when interacting with our customers and each other?

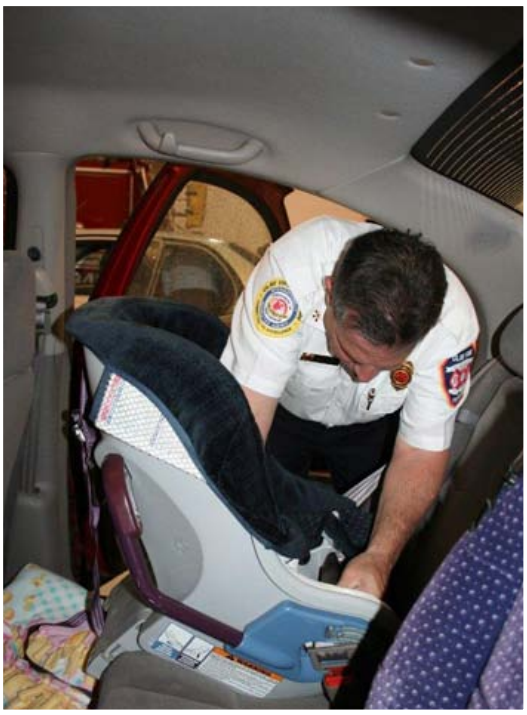

PHOTO COURTESY CLAY (IND.) FIRE TERRITORY

As firefighters, we can "save the day" in a lot of different ways. The simple tasks we perform on a daily basis help shape the public's opinion of us.

Any service delivery that involves human contact requires accurate *non-hazard-zone* risk-management strategies. These situations include EMS delivery, customers visiting the firehouse and any customer interaction in public. It also involves the interactions and behaviors of firefighters or crews in the firehouse, e.g., normal firefighter interactions, training or "bonding." Poor behavior in any of these areas might seem minor. However, as noted in many recent headlines, the consequences of falling short in these areas can have serious repercussions for the individuals, the station and the department.

To illustrate non-hazard-zone firehouse risk potential, I would like to discuss a situation that occurred on my watch while I was the captain of an engine company in the central part of my city. I had an excellent crew of like-minded B-Shift firefighters who varied in experience from five to 30 years. We were in a multi-company station in a socio-economically depressed community that relied considerably on the fire department for more than fire suppression. My department had decided to add baby-seat installation as another service to the community. This required interested firefighters to become trained in safe installation practices.

One shift, a gentleman rang the front door and asked to have a car seat installed for his infant. He said he had already been to two neighboring

Click here to visit Chris Stewart's blog. Ask questions and share your opinions with other company officers.

firehouses, but they didn't have an appropriately trained firefighter for the job. I realized that we had a trained installer working an extra shift on our ambulance that day. I got on the station intercom and asked him to come to the front room. When he arrived, we explained the gentleman's request, and I said we'd help him out. The firefighter paused and, in front of my crew and the customer, said he couldn't do it because there were new rules regarding installation scheduling and locations, and that our station wasn't an "approved" location. This customer could have easily left our firehouse and told everyone who would listen, "Those damn firefighters didn't take care of my car seat when they easily could have."

For me, the only solution was to politely and firmly tell the firefighter, "Yes you can, should and will install the seat." I walked with him outside to assist. It was the right thing to do for the customer and helped ensure his child's safety. Quality service delivery and open public interaction might be the best weapon we have when battling political assaults. Perception of our performance or interactions have become so scrutinized recently that it should cause us to establish some kind of plan for managing our non-hazard-zone risk.

After installing the car seat, we had a couple other issues to deal with. First, it was the two firefighters who witnessed the incident were disgusted. I was sure my crew would punish the visiting firefighter with uncomfortable and prolonged psychological torture. Second, I had to figure out how to maintain my own productive relationship with this firefighter for at least the remainder of the shift. Company officers have an obligation to their department, customers and their crew to maintain the station's ability to deliver service and not let issues get in the way. Sometimes I have to ignore my inner voice to manage these situations. My inner voice in this instance was screaming, "Hey dumbass, just do your job and help the poor guy out!" I am sure you can see the benefit of not communicating with this inner voice. Instead, I chose to pull the firefighter aside afterward and explain the risks and consequences of not doing our job. At the same time, I was able to reiterate my expectations for the remainder of the shift. As for the other firefighters who witnessed this interaction, I simply told them afterward that it has been handled and thanked them for their defense of our reputation. Fortunately, we had a trusting relationship and my acknowledging the issue was good enough for them.

I have found that most firefighters have a true sense of right and wrong. My appeals to their sense of conscience have mostly been successful. Placing the firefighter in the customer's shoes can be equally effective. However, when none of these options works, looking them in the eyes and clearly stating, "Being an asshole in my firehouse ain't an option!" can be quite effective.

Consequences of firehouse risk are not always clear. Failure on our part to manage the firehouse risk may not physically kill us, but it can impact our crew's morale, unity, career, pension and/or personal/family life. There are cases of firefighters behaving in a manner that seemed funny or inconsequential at the time, but when exposed by media or law enforcement, lead to bad outcomes for the individual (loss of pension), crew or department (loss of public and political credibility). Obviously, the range of consequences is very dependent on the severity of the risk or behaviors. There are many examples in the American fire service that emphasize how failure to recognize and manage firehouse risk can damage departmental reputations and customer approval. These negative situations become political fodder and can result in negative economic impact and distraction from our real work.

Keep It Consistent

Ideally, the best way to manage firehouse risk is pre-emptively on a day-to-day basis. Maintaining a management style that is not about "me" but about the

firehouse and the customer is critical in establishing credibility with your crews and companies. The company officer must consistently play the role of the designated adult to assist with establishing firehouse and company expectations for behavior and attitude. Firehouse and company expectations should mirror those of the department. "Moving" or "floating" expectations within a firehouse or crew depending on which company officer is working can damage unity and service delivery. Expectations should be specific regarding customer-service and interpersonal actions, just like the ones we have regarding fireground safety. The company officer must always maintain the ability to say "stop" when things are out of balance. Failure to do so when necessary can be crippling. Firefighters typically sense when things are on the wrong track, and if company officers randomly select when to use the stop button, your crews will eventually eat you alive.

There are several reasons why a company officer might avoid (or fail at) firehouse risk management. A company officer's personal insecurities can impede effectiveness. Many company officers are afraid to stop risky behavior because they fear they won't be "one of the guys" anymore. Being the designated leader means you won't always be popular. Sometimes insecurities lead to micromanaging the crews and their work, which can affect a crew's ability to trust its company officer. Finally, some insecure company officers allow a boss (battalion chief) to manage their firehouse and crew. This will quickly demonstrate your lack of ability to manage when it is truly needed. In my experience, your crew wants you to lead, but you have to do it on your own.

Do the Right Thing

I certainly believe managing the firehouse risk has huge value that goes beyond the firehouse. It is a critical step in really doing our job as supervisors. Typically, it means doing the right thing for the customer and the firefighters regardless of situation or the convenience. In the current political environment, the company officer's ability to stay focused on service delivery may have the most far-reaching impact of any political activity that we do. Due to poor economic conditions, the public is demanding more accountability from government officials nationwide. We are public officials, and we just happen to be the ones who actually deliver the public service. This places our actions and attitudes toward customer service in the spotlight. Our internal actions are now much more easily shared with the public via video recordings of our often humorous and sometimes stupid behavior. As company officers, we need to identify and manage firehouse risks similar to how we manage the fireground. Again, quality service delivery and open public interaction may be the best weapons we have in battling political assaults. There are many recent examples of happy customers/taxpayers shutting down blowhard politicians trying to vilify firefighters and reduce their salaries/pensions. BS

Chris Stewart began working for the Phoenix Fire Department (PFD) in 1991. He became a firefighter in 1993, and has spent the majority of his career working on busy engine companies. In 2000, he became the company officer of an engine company. Chris has served as a recruit training officer at the PFD training academy. He has developed multiple procedures and training for the PFD including high-rise operation, air management and bulk fuel storage facilities. He is currently assigned to Battalion 3 on B Shift. Chris was fortunate enough to marry his high-school sweetheart and is proud to have two sons who take after their mother.

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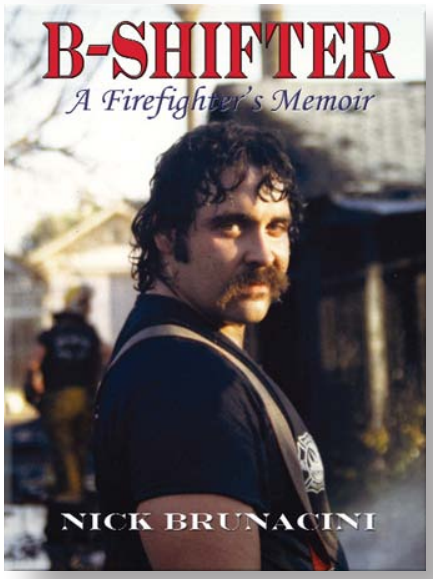

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Easier Access

This issue's drills highlight pressurized water supply & reverse hoselays.

BY BLUE CARD STAFF

This quarter's simulation is based on the same single-family residence used for last quarter's sim. In the last issue, the fire was in the basement. This time around, the fire is on the second floor. Merely changing the fire's location completely alters the incident action plan (IAP).

View of the Alpha Side.

Sizeup Charlie Side.

Strategic-Level Overview

This fires's critical factors include:

- Medium-sized, two-story house with a basement;
- Alpha Side shows a working fire from the second floor. Delta Side shows fire from the attic gable;
- Good access through the Alpha Side front door;
- Close exposures on the Bravo and Delta sides;
- No products of combustion visible from the garage of the roof/attic space; and
- Fire appears to be contents with possible extension to the attic.

Based on the current front view, the structure has survivable space and savable property. Because we have available resources and an uninterrupted water supply, the strategy is offensive. Based on this view, the initial attack line should go through the front door and advance to the second floor for search, rescue and fire control.

If the homes in your community have basements, the initial size-up must include a 360 of the entire structure. This helps to eliminate situations where firefighters end up operating on the first floor, above a working basement fire.

Our 360 reveals additional critical factors:

- This structure is made out of lightweight construction systems and materials. Prior to making entry, the IC must perform a 360 to confirm there is no fire in the basement;
- It is obvious from the Charlie Side that the house has a total of three levels;
- The fire is burning on the second floor and is showing from the roof eves above the second floor on the Charlie Side;
- There is also fire showing through the roof toward the Delta Side;
- There appears to be survivable space and savable property inside the structure.

Based on having available resources and an adequate water supply, the strategy remains offensive.

Based on the Charlie Side view, the initial IAP is correct. The initial attack line should be advanced through the front door to the second floor for fire control and to support search and rescue.

The critical factors visible on the Bravo side include:

- Light smoke showing from a second-story window;
- The property slopes/drops off toward the rear of the lot. The basement is visible as you make your way to the Charlie Side;
- The backyard is fenced, which may impede access through the Charlie Side;
- The structure has vinyl siding; and
- Nothing visible on the Bravo side would change the IC's initial IAP.

The critical factors visible from the Delta Side include:

- Fire showing from second-story windows on the Alpha Side;
- Fire showing from an attic in the Delta Side gable vent;
- No backyard fence on the Delta Side. Any lines that need to be brought in from the rear should be advanced around the Delta Side; and
- Nothing visible on the Delta Side changes the IC's initial IAP.

The critical factors that direct our initial attack include:

- A medium-size, two-story house with a basement; the basement has no outside exit/door (must make access to the basement from inside the house);
- New home made out of lightweight construction materials;
- Working fire on the second floor with possible extension to the attic;
- Good access around the structure; backyard fence on the Bravo Side; and
- 360 reveals basement is clear (safe to operate on first floor).

Size-up Bravo Side.

Size-up Delta Side.

The initial radio report should go something like this:
"Engine to Dispatch. Engine 1 is on the scene of a medium-size, two-story house with a working fire on the second floor. Engine 1 is establishing a water supply and will advance an attack line through the Alpha Side to the second floor for search, rescue and fire control. We will be operating in the offensive strategy, and Engine 1 will be Main Street Command."

IAP for the initial attack.

Follow-up report:
"Command to Dispatch. 360 is complete. We have a basement with no exterior access. Outside size-up indicates basement is clear. We will be continuing the attack through Alpha. Balance the assignment to a full box. Engine 1 will be the Alpha Side accountability location."

Several rooms on the second floor are involved in fire with some fire extension into the attic. This places the initial attack on the second floor. Two to three crews will end up cycling through operations on the second floor.

The next areas requiring attention are the basement and first floor. Your department's policies and procedures regarding fires in structures with basements should dictate which of the areas you address first.

The critical factors dictate the initial radio report.

Size-up upon the BC's arrival.

The first floor has light smoke at the ceiling, an "all clear" and no fire extension.

The basement has light smoke at the ceiling, an "all clear" and no fire extension.

Crews on the second floor have pulled the ceiling and are applying water into the burning attic. Fire control on the second floor and in the attic is imminent.

Support work

- Open ceilings on the second floor;
- Ventilation—Because the roof is made out of lightweight construction systems and materials, seriously consider keeping firefighters off the roof. In many cases, we can control the fire within the first 5 minutes of the operation, eliminating the need for vertical ventilation. Horizontal ventilation may be a better option. Use care when operating PPVs to avoid accelerating the fire in the attic;
- Secure electric and gas utilities; and
- Consider throwing ladders to the upper-floor windows.

These are the conditions upon the BC's arrival. At this point in the operation, crews have water on the fire, and fire control for the entire incident scene is imminent. However, more work remains. The BC should transfer command and verify "all clears" and "fire control" for the basement and first floor. A CAN report should be obtained for the second floor. If one hasn't already been assigned, an on-deck crew should stage on the Alpha Side. Future needs will include performing required salvage operations on the lower floors and establishing occupant support to connect with the owner/occupant. As companies cycle out of the hazard zone, the IC should obtain PARs.

Task-Level Drills—Pressurized Water Supply General Guidelines

When laying lines, we must consider the access problems they can create. Always lay supply lines along the side of the road where the hydrant is located, and cross over at the fire scene if necessary. Maximum speed when laying supply lines is 10 mph. Faster speeds can lead to excess hose on the roadway and increase the possibility of a supply coupling getting caught in the hose bed. Slower speeds:

- • Reduce the risk of striking pedestrians, spectators, vehicles or other apparatus and firefighters working at the scene;
- Provide time for the company officer to size-up and evaluate the critical fireground factors; and
- Provide time for the engineer to safely and appropriately spot the apparatus in forward/key positions.

We must identify key tactical positions and place forward pumpers in these locations early in the operation—with a strong water supply when necessary. The forward pumpers can then distribute this water supply to a variety of handlines, appliances, master streams or fire-department connections.

Fire hose eventually limits general access on scene as the fireground operation gets older. Command must direct apparatus to important positions as early as possible. Take full advantage of the hydrants closest to the fire area before laying additional supply lines from distant hydrants. Secondary hydrants should be used to obtain additional supply if the demand exceeds the closest hydrants' capabilities. Shared mains must also be considered when opening up secondary hydrants. These actions could reduce the water available to the forward pumpers operating in good tactical positions. Many times, pumped water is the best option to increase flows.

Laying lines can create on-scene access problems. Be smart about your hoselays.

Take advantage of the equipment on apparatus already in forward attack positions instead of bringing in more apparatus. Connect extra attack lines and appliances to forward pumpers, which already have a good water supply, instead of making daisy chain supply-line connections, which congest the scene.

Do not hook up to hydrants located so close to the fire building that structural failure or fire extension will jeopardize the water supply or the apparatus.

Friction loss for 5" LDH is 8 psi per 100 feet flowing 1,000 gpm. *Example:* A 1,000-foot lay of 5" flowing 1,000 gpm would have 80 PSI friction loss. This loss would result in a significant reduction in gpm and residual pump pressure at the forward pumper.

LDH supply-line lays longer than 500 feet should be pumped when supplying aerial devices, large-bore master streams or several handlines at once. A single 5-inch hose can deliver the entire volume of the hydrant (1,200 to 2,000 gpm depending on main size) when being pumped by a key pumper. This oftentimes makes it unnecessary to lay additional supply lines to forward pumpers in large volume water operations.

Reverse Hoselay—Forward Engineer

Evolution Overview

Reverse hoselays are used in hydranted areas when the initial arriving apparatus decides to make an initial attack using tank water. A second-due unit will typically reverse lay from the forward pumper to a hydrant to establish an uninterrupted water supply. If the reversing apparatus is an engine company, the captain and firefighter will typically dismount at the forward pumper and will engage in a task(s) specified by the incident commander (IC). If the forward pump operator is engaged in a pumping operation, the reversing company's crew will make the connections into the forward pumper and coordinate getting water into the pump.

Click inside the graphic to view the skills video for a forward engineer on a reverse hoselay.

Advantages of performing a reverse lay:

- Establishes an uninterrupted water supply to a forward position;
- Provides a water supply to the forward pumper of 600 to 2,000 gpm (depending on the length of the LDH lay, the hydrant and whether the line is being pumped);
- If an engine company is reversing, they can pump the supply line to maximize the available hydrant water;
- Gives the IC many more options in deploying/assigning later-arriving units once the water supply has been established; and
- Places apparatus in key positions without congesting the scene.

Disadvantages of performing a reverse lay:

- LDH hose can block or restrict access to the scene.

Task Overview

This evolution will require the reversing apparatus to stop 20 feet past the forward pumper. This will provide enough room to make the stretch to the intake valve without pulling excess hose off of the truck. The reversing apparatus will then proceed to the hydrant while the forward pump operator makes the connection into the appropriate intake valve.

Key Safety Points

Drivers must set the parking brake whenever in a stopped position on this evolution;
Don't drive over 10 mph when laying supply hose; and
Keep securing the hose until 2 lengths have played out of the supply hose bed.

Click the paperclip at right to download the reverse hoselay/forward engineer evaluation check-off sheet.

Reverse Hoselay—Direct Hydrant Connection: Key Engineer

Evolution Overview

Reverse hoselays are used in hydranted areas when the initial-arriving apparatus decides to make an initial attack using tank water. Typically, the second-due pumper or a tanker will establish a water supply for the forward pumper in a hydranted area by reverse laying from the forward pumper to the hydrant.

When an engine company performs a reverse lay to a hydrant, they have two supply options:

1. They can connect the supply hose directly to the hydrant for a low-water-volume operation; or
2. The engineer can make the hydrant connection directly into the reversing engine and then pump the forward pumper's supply line for a high-water-volume operation (or in situations when the supply-line lay is longer than 800 feet).

Click inside the graphic to view the skills video for a reversing engineer making a direct connection to the hydrant.

Advantages of performing a reverse lay direct connect:

- Establishes an uninterrupted water supply to a forward position;
- Provides a water supply to the forward pumper of up to 600 gpm, depending on the length of the lay;
- Gives the IC many more options in deploying/assigning later-arriving units once the water supply has been established; and
- Places apparatus in key positions without congesting the scene.

Disadvantages of performing a reverse lay:

- A direct connection to the hydrant will not supply the maximum volume the hydrant can deliver; and
- LDH hose can block or restrict access to the scene.

Task Overview

This evolution requires the reversing apparatus to stop 20 feet past the forward pumper. This provides enough room to make the stretch to the intake valve without pulling excess hose off of the truck. The reversing apparatus will then proceed to hydrant and make the supply hose connection directly to the hydrant.

Key Points

- Verify the hydrant is working before doing your pull back; and
- If a tanker is reversing, they must do a direct connect into the hydrant.

Click the paperclip at right to download the direct hydrant connection/ key engineer evaluation check-off sheet.

Reverse Hoselay—Pumped Supply Line—Key Engineer

Evolution Overview

Reverse hoselays are used in hydranted areas when the initial-arriving apparatus decides to make an initial attack using tank water. Typically, the second-due pumper will establish a water supply for the forward pumper in a hydranted area by reverse laying from the forward pumper to the hydrant.

This hose lay can only be done with an engine company. All tankers must make direct connections to the hydrant.

When an engine company performs a reverse lay to a hydrant, they have two supply options:

1. They can connect the supply hose directly to the hydrant for a low water-volume operation; or
2. The engineer can make the hydrant connection directly into the reversing engine and then pump the forward pumper's supply line for a high water-volume operation (or in situations when the supply-line lay is longer than 800 feet).

Click inside the graphic to view the skills video for a reversing engineer pumping the supply line to the forward pumper.

Advantages of performing a reverse lay with pumping the supply line:

- Establishes an uninterrupted water supply to a forward position;
- Provides a water supply to the forward pumper that can supply the entire volume of the hydrant;
- Gives the IC many more options in deploying/assigning subsequent arriving units once the water supply has been established; and
- Places apparatus in key positions without congesting the scene.

Disadvantages of performing a reverse lay:

- LDH hose can block or restrict access to the scene.

Task Overview

This evolution will require the reversing apparatus to stop 20 feet past the forward pumper. This will provide enough room to make the stretch to the intake valve without pulling excess hose off of the truck. The reversing apparatus will then proceed to hydrant, use a short length of supply hose to connect the hydrant into their pump, and then pump the supply line to the forward pumper.

Key Points

Verify the hydrant is working before doing your pull back; and
If a tanker is reversing, they must do a direct connect into the hydrant.

Click the paperclip at right to download the reverse hoselay, pumped supply line/key engineer evaluation check-off sheet.

Click here! Visit The Drilldown's blog to ask questions or share experiences.

Getting Defensive

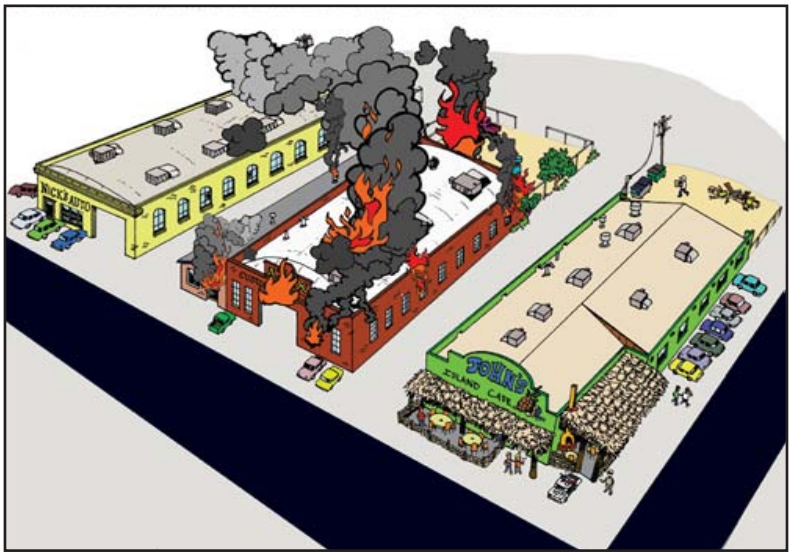
When initial & reinforced ops can't knock down the fire, it's time to escalate operations.

BY NICK BRUNACINI

The first two articles in this trilogy covered *initial* and *reinforced* incident operations. Initial operations occur at the beginning of the incident. *To summarize:* Company officers, operating in the fast-attack position, typically manage initial ops. This closely resembles guerrilla warfare: The first-arriving officer takes command and assigns the first couple of attack lines into service and orders any required initial support work. This operation is quick to set up, takes advantage of our best offensive window of opportunity and brings the vast majority of structure fires under control. Initial operations shouldn't last longer than a bottle of air.

If initial operations don't quickly control the hazard(s), we must reinforce operations to ensure the ongoing safety of all personnel operating in the hazard zone. This occurs by transferring command to an incident commander (IC), who will operate in a strategic command position within a command post. Along with a strategically positioned IC, warm-zone tactical bosses are a necessary element for reinforced ops—divisions, groups and sectors are all tactical-level organizational units.

In this article, we will cover *escalated* incident operations.



ILLUSTRATIONS BY POONEY PICKERING

Image 1

The C Team

In the first two installments of this series, we used an offensive fire in a medium-sized cabinet shop as our example (see Image 1, above). Because the hazard phase of that operation ended in less than 15 minutes, we need to change things a bit for this article to accommodate escalated operations. For this installment, we are going to plague our cabinet shop with defensive fire conditions. A defensive firefight in a building this size will last longer and require additional resources, necessitating an escalated operation. For this article, we will use a staffing model that pairs response chiefs with command partners: aides, field-incident technicians, "buggy boys," etc. If your system doesn't staff response chiefs vehicles with two officers, don't worry about it; simply pair these tactical-level officers when they arrive on scene.

Escalated operations provide the command positions needed to manage the multiple radio channels required for larger incidents. This allows the IC to manage only the tactical radio channel. Transitioning from reinforced to

escalated operations *does not* require another transfer of command. The only reason we made the first, and only, command transfer was to move incident command from a fast-attack position (inside a burning building) to a strategic position (inside a command post). Once we get an IC in a strategic position, it is much better to support them rather than transfer command any time the next higher-ranking officer arrives. Multiple command transfers tend to destroy the incident action plan (IAP) while simultaneously flushing strategic-level accountability down the toilet. These needless command transfers often doom both reinforced and escalated operations.

Our command process began with our fast-attacking company officer IC (IC. No. 1) starting initial operations. (For more on initial ops, read "A Good Front End," pg. 60, Summer 2011.) All of IC No. 1's assignments had been transmitted over the tactical radio channel. Because the next chief to arrive on scene—IC No. 2—was part of the initial dispatch, they heard all IC No. 1's assignments while they were responding to the scene. This is facilitated when IC No. 2 has a command partner driving the vehicle. When IC No. 2 arrived on scene, they confirmed the position and function of all hazard-zone units as part of the command-transfer process. (For more about reinforced operations, please review "A Strategic Second Wind," pg. 54, Winter 2012 issue.)

This is manageable because IC No. 1 typically doesn't assign more than three or four units in the time it takes IC No. 2 to arrive to the scene. At this point, a strategically positioned IC is in place. Our strategically positioned IC may end up with 10 or more companies assigned by the time a larger command post arrives on scene and allows us to move into escalated operations. Because our IC came equipped with a partner now functioning as the support officer, the tactical worksheet should be accurate. This will enable the IC and support officer to maintain control of the position and function of all firefighters operating in the hazard zone.

Image 2

When the alarm was upgraded, a second channel was used to dispatch all units beyond the full alarm (box assignment, second, greater alarm, etc.). The automatic response of the functional, non-hazard-zone incident responders should be included when balancing/upgrading the alarm. This embeds the PIO, fire investigations, occupant support, logistical support, rehab and light & air apparatus within the upgraded assignment. At this point, the IC will require support to manage the additional radio channels needed (particularly someone to manage the logistics/staging/rehab channel).The senior advisor is the third and final position of the command team. The senior advisor is the ranking member in the command post. In larger metro departments, the senior advisor is typically the highest-ranking member of the shift, such as a shift commander. The senior advisor runs the command post and serves as the department's tactical authority for that incident. Their responsibilities include making sure the current strategy is correct and that the IAP is meeting the incident's needs. It's imperative for the senior advisor to verify whether an effective incident organization has been established. An ineffective incident organization can overload the IC. For example, assigning 10 task-level companies without warm-zone tactical bosses would completely pollute the tactical radio channel and disable the strategic level. Before the senior advisor can put all the correct elements into the right places, they must set up the command van.

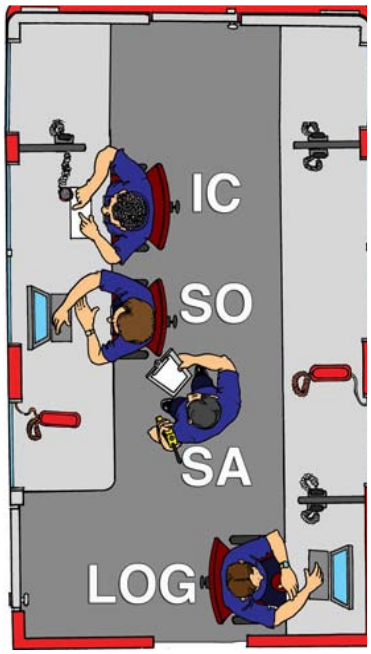


Image 3

The IC's span of control increases when we delegate the management of Level 2 staging, rehab, PIO, investigations and occupant support. The senior advisor is responsible for filling these positions. This allows the IC to maintain their focus on the hazard zone, representing the major reason we move into a command post designed for escalated operations.

The Van with the Plan

The command van is designed to manage multiple radio channels. It should stage out of the way but offer a panoramic view of the scene. The setup process will vary slightly from jurisdiction to jurisdiction. Most of these differences are based on the varying technologies fire departments use for communications, dispatch and accessing preplan information. A standard setup list for escalated command posts includes getting all the radios on the correct channels, pulling any preplan info (a Google Maps overhead image of the incident scene is nice) and a list of all incident scene resources.

When the command van is set up and ready to go, the senior advisor should contact the IC over the tactical radio channel and move command operations to the command van. Simply contacting the IC over the radio and saying, "We're set up and ready whenever you are," won't create enough of a break in all the tactical radio traffic for the IC and support officer to move from their response vehicle to the command van. The senior advisor must make it implicitly clear that command is being moved to the command van, and the IC and support officer need to haul ass from the current response vehicle into the command van. "We are transferring command to the command van. Make your way over now," will inspire the IC and support officer to make their way to the command van in a minute or two (see Image 2).

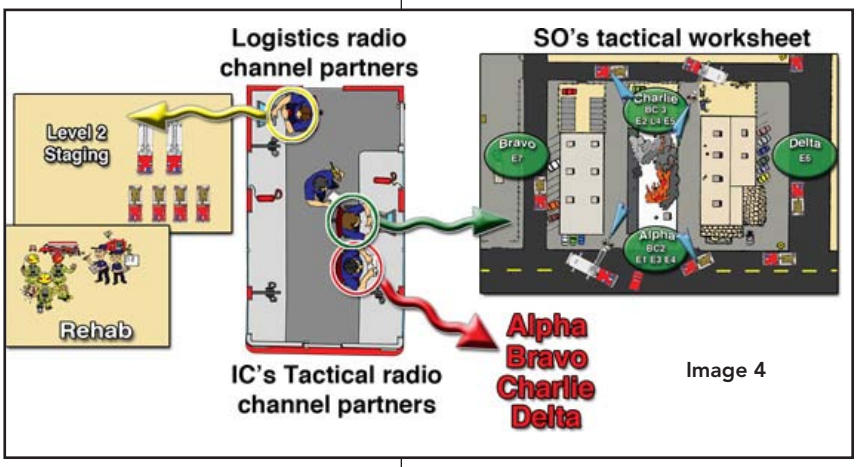


Image 4

Note: The command van is the best command-post option for escalated operations. It places the entire strategic organization in one place with multiple radio channel capabilities. It is important to remember that the command post is not a staging area for chief officers without any organizational assignment. It's a command post, not an RV. The senior advisor must manage the command post in a way that keeps all the command players focused on their responsibilities. Things become more difficult when you only need a five-person command team and end up with 10 people in the command post. The five without a job will distract the five with a job. Move the loiterers to staging or give them an assignment.

At this point in the incident operation, the command team is assembled in the command van (see Image 3). The incident operation has four attack positions—two managed by warm-zone tactical bosses (Alpha and Charlie). Companies have also been assigned to Bravo and Delta. If Bravo and Delta become more active, assign warm-zone tactical bosses and safety officer to these positions also. A Level 2 staging area has also been established.

One Set of Ears Per Channel

We use the tactical radio channel to manage and connect with firefighters operating in the hazard zone. The IC's No. 1 safety responsibility is to maintain this connection whenever personnel operate in harm's way. Although it is common across the fire service for the IC to manage and monitor multiple radio channels, we must assign anything that diverts the IC's attention from the hazard zone to other command-post players (see Image 4). Delegate other radio frequencies, such as dispatch, staging, mutual aid, law enforcement, RIT, etc. No one person can simultaneously manage the tactical radio channel while monitoring several other radio channels. The IC doesn't need to talk to the PIO, staging, rehab or anyone else when firefighters are operating in positions that can kill them. That's why we build command teams.

IC's Eye on the Zone

The senior advisor should spend as little time as possible talking to the IC, especially when firefighters are operating in an IDLH atmosphere (immediately dangerous to life and health). The IC must constantly monitor the incident conditions and control the operation over the tactical radio channel. Eyes forward with a headset on. When the senior advisor walks up behind the IC to have a chat, the IC will take off their headset, turn around and focus all of his attention on the senior advisor. What if this is the moment Engine 5 decides they are going to have a mayday? When the IC stops commanding to talk with his boss, there is no one managing the tactical radio channel. It is preferable for the senior advisor to have their face-to-face conversations with the support officer, who can brief the IC during the next lull in the operation.

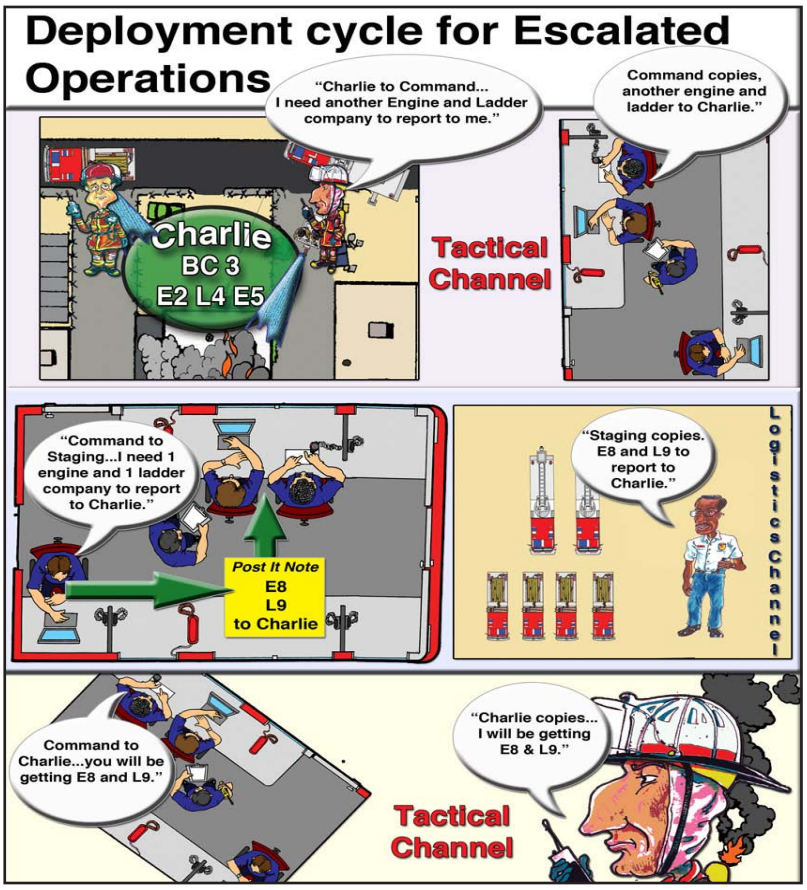


Image 5

Logistics & Warm-Zone Bosses

A logistics channel is necessary to communicate with units in Level 2 staging. Therefore, logistics is typically the second radio channel we activate. During two-channel incident operations, logistics is also used for rehab. Many departments automatically dispatch greater-alarm assignments on a different radio channel. Managing communications with this two-channel approach eliminates situations where the IC is receiving critical reports from the initial-operating units only to be interrupted by second-alarm units looking for the best route to Level 2 staging. This second radio channel also allows the Level 2 staging officer to communicate with incoming resources without disrupting the tactical radio channel. This is why we dispatch greater alarms on a different radio channel.

Because logistics operates out of the command van, they should use the radio designation "command." This will not create any confusion because logistics operates on a different radio channel from the IC (the other "command"). The logistics section's first order of business is to determine who will serve as the Level 2 staging officer. Most staging SOPs state the officer of the first unit arriving at Level 2 staging will serve in this capacity until the responsibility can be transferred to a later-arriving chief officer.

Building a true tactical level for the incident organization allows the IC to maintain strategic control. Assigning warm-zone tactical bosses places static supervision, management and leadership in critical attack positions. These warm-zone bosses manage the tactical details of their assigned operational area. As a general rule, warm-zone bosses should be assigned to attack positions requiring three or more companies. When the warm-zone boss understands the overall incident strategy and how their operational area fits into the IC's overall plan, it streamlines radio communications. For example, the warm-zone boss requests the resources. Once the IC fills the requests, the warm-zone boss orders the assigned companies into action. This prevents the IC from becoming bogged down with the details of getting task-level units into action during reinforced and escalated incident operations. It also keeps the number of the IC's radio partners manageable. The communications process is further enhanced by assigning warm-zone bosses in active attack positions.

They primarily use face-to-face communications with their assigned personnel, helping to keep the tactical channel clear (see Image 5) for the command-post communications loop between the IC, senior advisor and logistics.

Safety in Numbers

As previously stated, staffing response chiefs with command partners offers the most flexibility for quickly building an effective incident organization. Predefining the roles and responsibilities ahead of the event and then training to those policies, standards and guidelines places us in the best position to be successful. We tend to employ the defensive strategy for escalated structural firefighting operations. It takes a while to transition into escalated ops—longer than most buildings will endure an out-of-control fire. Long-term offensive firefighting operations require an accountability system to track a greater number of companies and keep up with the rigors of longer operational periods. The IC's strategic-level accountability capability is directly connected to the incident organization's tactical level.

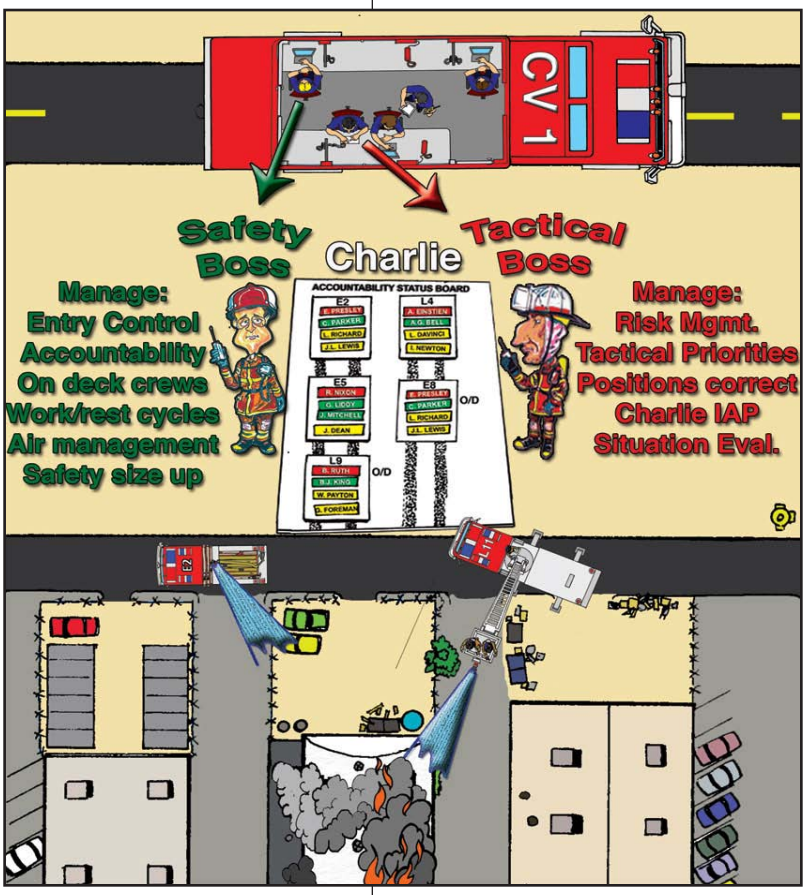


Image 6

Using our defensive cabinet shop as an example, we will use a fifth alarm's worth of companies: 20 engine companies, 10 ladder companies and all the corresponding command and support equipment and personnel (you don't need nearly that many companies for our cabinet-shop fire, but escalated operations are designed to manage this many companies, so please play along). An incident operation of this magnitude ends up with more than 130 firefighters. The command and management components for only the hazard-zone piece of the operation requires 13 people:

Strategic Level—5: IC, support officer, senior advisor, logistics and safety; and Tactical Level—8: Alpha, Bravo, Charlie and Delta. A battalion chief and company-officer command partner manage each of these attack positions. The partner serves as the safety officer when managing a tactical assignment. Additional officers are necessary to manage Level 2 staging, rehab and any other organizational assignments.

Longer incidents, especially ones that require many resources, can make it challenging for the support officer to maintain the tactical worksheet. Our fifth-alarm cabinet-shop fire will end up with an average of four engines and two ladder companies in each of the four attack positions, with another alarm in Level 2 staging as a tactical reserve.

Managing the tactical worksheet becomes even more of a challenge when companies operate in the offensive strategy inside the structure. The support officer should be able to track each company to their tactical assignment, but as time goes by, it becomes increasingly difficult to track each company's exact position within their tactical assignment. (Are they in, out or in an on-deck position?) This isn't much of an issue when employing the defensive strategy, when everyone is operating outside the structure.

Because we have four attack positions, it would completely overload the tactical radio channel for the IC and support officer to track accountability so

closely. The solution is to assign a safety section in the command post. When the IC fills this position, they announce it over the tactical channel and tell all safety officers to switch to the safety channel. The safety channel is typically the third channel the command team activates, and its primary function is managing accountability. After each safety officer acknowledges the request, the safety section contacts each one for an update on the position and function of all assigned resources (see Image 6). The safety section records this info and hands it to the senior advisor, who in turn passes it to the support officer who then uses it to keep the tactical worksheet accurate. This allows the command team to get routine PARs on all operating units without seizing up the tactical radio channel.

The final link in the accountability chain is rehab. Eventually all working companies will make their way to rehab before being released from the scene. Rehab operates on the logistics radio channel when only two radio channels are in operation (the tactical and logistics channels). When warm-zone tactical bosses assign their fatigued companies to rehab, the company switches from the tactical channel to logistics because they are no longer assigned to the hazard zone. If the incident operation is using three radio channels (tactical, logistics and safety), rehab can operate on the safety channel. This allows the safety officers and the safety section to communicate directly with the rehab sector and completes the accountability-communications link.

Conclusion

Developing and using a standard routine for managing the wide range of hazard-zone operations we face provides the best shot at being successful when the fire gods smile upon us. this is never more true than when we are operating for long durations in hazard zones that require a lot of staff and additional resources. A solid routine for escalated operations helps us manage the hazard zone's many moving parts and ensures the safety of everyone on scene.

***Click here!* Visit Nick's blog to discuss his column.**

Nick Brunacini joined the Phoenix Fire Department (PFD) in 1980. He served seven years as a firefighter on different engine companies before promoting to captain and working nine years on a ladder company. Nick served as a battalion chief for five years and in 2001, he was promoted to shift commander. He then spent the next five years developing and teaching the Blue Card curriculum at the PFD's Command Training Center. His last assignment with the PFD was South Shift commander; he retired from the department in 2009. Nick is the author of "B-Shifter—A Firefighter's Memoir." He is also the co-author of "Command Safety" and "The Anatomy and Physiology of Leadership."

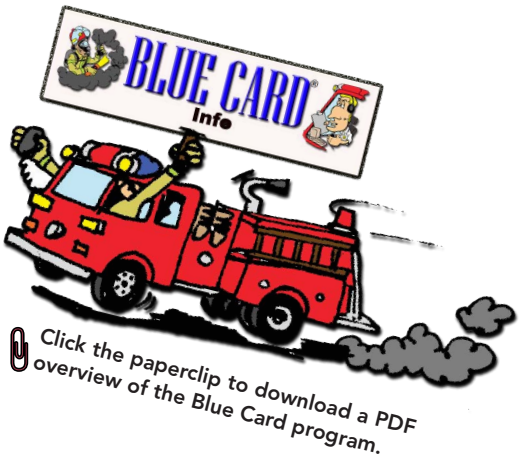
Blue Card CE Freebie!

Exercise your IC muscles with this sample tactical scenario from Blue Card's CE module.

BY B SHIFTER STAFF

Each issue, the Continuing Education column will feature a tactical scenario from this quarter's Blue Card Continuing Education (CE) Module. The quarterly CE modules are available for one year to all students who have completed the 50-hour Blue Card online training program. The scenario will also give those who haven't subscribed to Blue Card a brief look at the web-based training platform that we produced to host the program. Enjoy the scenario, and please be safe out there.

This quarter's free Blue Card Continuing Education sample, right, deals with fires in single-family, residential structures with basements. We focus on lightweight construction, because the tactics and firefighter safety requirements for fires in these types of modern buildings differs from fires in older, legacy-style homes. BS



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FUNCTION #1
DEPLOYMENT

BLUE CARD
Hazard Zone Command Training & Certification Program

This issue's SOP highlights Command Function 3: Situation Evaluation. The size-up process is closely connected with Command Function 5: Strategy & Incident Action Planning (IAP). This is one of the major philosophical differences between the traditional approach to structural firefighting and the Blue Card system. In Blue Card, size-up of the incident's critical factors drives all incident actions. The traditional approach is driven by the tactical priorities (rescue, fire control and property conservation). Using the critical factors to identify the strategy customize the IAP institutionalizes the concept of "applying standard action to standard conditions (i.e. critical factors) to achieve a standard outcome."

We provide these SOPs in Microsoft Word format (click the paperclip at right) so you can customize the content for your department's needs.

Hazard-Zone Management Standard Performance Benchmarks for Function 3: Situation Evaluation

3.4 Situation Evaluation

Major Goal: To develop and use a regular approach to situation evaluation using the standard forms of information management and incident factors.

3.4.1 The first-arriving unit (officer) must demonstrate the ability to conduct a rapid, accurate, size-up. This duty involves conducting a rapid and accurate size-up.

(a) Requisite Knowledge: The initial unit (IC) shall demonstrate the ability to conduct a rapid size-up using a standard radio reporting system.
Arrive on the scene;
Building description;
Describe the problem;
Action taken;
Declare strategy;
Assume and name command (with dispatch/communications);
Accountability positions; and
Safety concerns.
(b) Requisite Skills: Execute a size-up and having the ability to interpret visual information into communicated message that provides command and control.

3.4.2 The incident commander shall have the ability to use all local preplan resources available, monitor its usage and implement that information into the incident. Demonstrate the ability to read, process and communicate with maps, preplans, computer terminals (MDTs, MCDs) and reference materials, which provides incident information management and firefighter safety.

(a) Requisite Knowledge: The ability to read, write, track and maintain accurate awareness with information.
(b) Requisite Skills: The ability to read, process and communicate with maps, pre-plans, and reference materials that provide for incident management and safety.

3.4.3 Demonstrate the ability to document incidents using a tactical worksheet. The tracking of information, building drawings, times, placement of apparatus and crews is accurate for incident management and safety.

(a) Requisite Knowledge: The use and implementation of a tactical worksheet in providing documented support information.
(b) Requisite Skills: The ability to write, track and maintain with accuracy incident information and process the information into incident actions.

3.4.4 Facilitate crews, companies, division, groups, sections, and branches as information is reported and received. The ability to report and receive information and radio communications.

(a) Requisite Knowledge: The ability to communicate and process information and make decisions based on that information process.
(b) Requisite Skills: The ability to process information, react, and to communicate the information and create a decision making environment.

3.4.5 Detect and react to the incident / Safety "red flags." "Red Flags" are recognized and handled in a timely manner to enhance responders and public safety.

(a) Requisite Knowledge: The ability to recognize unsafe situations and respond appropriately.
(b) Requisite Skills: Implement rapid evaluations of potential emergency situations and react with appropriate decisions dealing with the emergency.

3.4.6 Establish and maintain a realistic awareness of elapsed incident times around tactical positions, the tactical priorities of the incident, and firefighter safety. When the strategy and tactical priorities are established and the elapsed time monitored, it provides for greater firefighter safety.

(a) Requisite Knowledge: The ability to maintain an understanding about the influence of elapsed time and its impact on incident operations and safety.
(b) Requisite Skills: Establish procedures for managing elapsed times and firefighter safety within a decision making process.

3.4.7 Implement the "strategic decision making process," that will identify the significant fixed factors that don't change: roof types, building layout, hydrant location, and the variable factors that can change: wind, fire conditions, response profile, etc. This will allow for effective decision making and create a safer incident scene.

(a) Requisite Knowledge: Establishing the "strategic decision making model" as the foundation for decision-making.
(b) Requisite Skills: The ability to execute and deliver the "strategic decision making model," while using the incident communication process.

3.4.8 Conduct a situational analysis, given an incident or planned event. Using incident-related information, so that incident life safety, environmental, and property risks are assessed, and a clear situational picture is obtained for processing that information analysis through the risk management plan.

(a) Requisite Knowledge: Appropriate strategies and tactics for various types of incidents, safety factors and consideration for incident operations, and variables and conditions that affect incident outcomes.
(b) Requisite Skills: Performing a size-up and interpreting incident information for the purpose of verifying its effectiveness, appropriateness, and safety.

Base Actions Based on Conditions

The incident commander (IC) conducts an initial size-up in the very beginning of the operation to obtain the information required to determine the correct course of action. Structural firefighting operations are managed around the completion of the three (3) tactical priorities: rescue, fire control and property conservation. Effective action results from formulating a plan based on the actual incident conditions. The critical factors represent the incident's terrain. The size-up process is used to identify this "terrain" so we can develop a strategy and plan that describe how the tactical priorities will be achieved. The fifth function of command, strategy and incident action planning, goes into detail of how the critical factors are used to identify the strategy and develop the incident action plan (IAP). The incident conditions are described in the terms of the critical factors. There are eight (8) critical factors categories. They are (in no particular order):

- Building
- Occupancy
- Fire
- Life safety
- Arrangement
- Resources
- Action
- Special circumstances

Each of these broad categories is broken down further to identify the specific critical factors, listed below. These critical factors become the reporting elements the IC, and other incident responders, use to process orders and needs, describe the incident scene, and progress toward the completion of the tactical priorities. Any factor that directly impacts the completion of the tactical priorities or firefighter safety makes it a critical factor. Sizing up the situation prior to taking action eliminates "Ready, fire, aim!" syndrome.

Critical Factors for Buildings

- ✓ Size—small, medium, large, jumbo
- ✓ Height—number of stories/levels, identify basement if present
- ✓ Construction type—legacy, lightweight, tilt slab, balloon, etc.
- ✓ Age
- ✓ Condition—stable/falling down
- ✓ Compartmentation/separation
- ✓ Vertical and horizontal openings, shafts, channels

- ✓ Outside openings—doors and windows, ability to access
- ✓ Utility characteristics (hazards/controls)
- ✓ Concealed spaces
- ✓ Initial action must verify status of attic and basement (if present)
- ✓ Exterior access
- ✓ Effect the fire has had on the structure, savable property remaining

Critical Factors for Fire

- ✓ Size, extent and location
- ✓ Stage—nothing showing, light smoke, smoke showing, working fire, defensive fire conditions
- ✓ Direction of travel
- ✓ Estimated time of involvement
- ✓ Fuel load—what's on fire and what remains to burn
- ✓ Intensity/stage—incipient, pre-flashover, ventilation controlled, explosive fire conditions
- ✓ Access—ability to operate directly on the fire

Critical Factors for Occupancy

- ✓ Specific occupancy type—house, apartment, strip mall, commercial, big box, hospital, etc.
- ✓ Value characteristics associated with occupancy
- ✓ Fire load—size & nature
- ✓ Status—open, closed occupied, vacant, under repair, etc.
- ✓ Salvage profile—China shop versus blacksmith shop
- ✓ Morale hazard—landmark building/occupancy, e.g. churches, barbecue joints, etc.

Critical Factors for Life Hazard

- ✓ Location of occupants (in relation to the fire)
- ✓ Number of occupants
- ✓ Conditions of occupants
- ✓ Incapacities of occupants
- ✓ Commitment required to obtain an "all clear" (firefighters, equipment, command)
- ✓ Fire control required to support search and rescue
- ✓ EMS needs
- ✓ Time estimate of fire effect on victims
- ✓ Access rescue forces has to victims
- ✓ Exposure and control of spectators
- ✓ Access to escape routes

Critical Factors for Arrangement

- ✓ Access, arrangement and distance of external exposures
- ✓ Access, arrangement and nature of internal exposures
- ✓ Combustibility of exposures
- ✓ Severity fire has on exposures
- ✓ Value of exposures
- ✓ Most dangerous direction/avenue of fire spread
- ✓ Barrier or obstructions
- ✓ Ability of apparatus to access
- ✓ Multiple buildings

Critical Factors for Resources

- ✓ Staffing and equipment on scene
- ✓ Staffing and equipment responding and estimated response time
- ✓ Condition of responders and equipment

- ✓ Capability of personnel
- ✓ Effectiveness of command & control and safety systems
- ✓ Amount of available water: hydrants and tankers
- ✓ Built in fire protection: sprinklers, standpipes, alarms, protected spaces, etc.

Critical Factors for Action

- ✓ Effect current action is having
- ✓ Work remaining to be assigned
- ✓ Stage of the operation
- ✓ Is the operation under control/are the actions effective?
- ✓ Is there an adequate tactical reserve?
- ✓ Can the IC control the position and function of all assigned resources?
- ✓ Is the current plan working?

Critical Factors for Special Circumstances

- ✓ Time of day/night
- ✓ Day of week
- ✓ Season
- ✓ Special hazards by virtue of holidays or special events
- ✓ Weather (rain, snow, heat, visibility, WIND, etc.)
- ✓ Social unrest (riots, terrorism, etc.)

Managing the Critical Factors

Each incident has its own unique critical factors. Basing the strategy and corresponding IAP on critical factors allows the IC to customize a response for each incident operation. Some factors are fixed. Fixed factors tend to be static and are typically beyond our control to change. The number of stories, basic footprint of the building and the type of roof are all fixed factors. These fixed factors become the information items we capture with prefire plans. The initial radio report for structure fires includes a description of the building (size and height), any obvious hazards, action taken (IAP), strategy and the assumption of command. This initial radio describes what's going on at the incident scene in terms of critical factors.

The variable factors include those factors that can change throughout the incident. This includes the fire, the wind and available resources (based on system-wide activity). These variable factors, especially those associated with the incident hazards, have a profound effect on firefighter safety. This represents the major reason that the situation evaluation process must be an ongoing function of command whenever firefighters are operating in a hazard zone (see Function 7: Review & Revise).

Strategic Decision Making Guide (SDMG) Begins with Situation Evaluation

The IC uses the SDMG to determine the correct incident strategy and corresponding IAP. Beginning the operation in this manner ensures more effective assignments to later-arriving companies and a safer operation overall. The elements of the SDMG are listed in the order they are performed:

1. The IC performs a situation evaluation of the critical factors.
2. These factors are processed through the risk-management plan (see Function 5).

3. The IC determines the correct strategy: offensive or defensive (see Function 5).
4. The IC formulates an IAP that begins to complete the tactical priorities (see Function 5).
5. The IC continues to evaluate the critical factors as the foundation of the review and revision process (Function 7).

Situation Evaluation Begins with the Initial Service Requests

The size-up process begins with the initial dispatch of the incident. The call intake system processes 911 calls into a dispatch. The info provided in the initial dispatch must include a physical address, nature of the emergency, assigned units and a radio channel. Multiple 911 calls are an indication of a working incident. Units responding to the incident should be familiar with the type of structures and occupancies found at the reported address. Thermal columns, flames and smoke visible during the response are all critical factors used as part of the initial size-up. This initial dispatch and response information becomes the baseline we use to build on. As the incident operation matures, so must our understanding of exactly what's going on at the incident scene.

The initial IC is typically a company officer who operates in the fast-attack position. This IC performs a visual size-up to identify the critical factors. This information is processed against past experiences (including training) to determine the correct strategy and corresponding IAP. In most instances the initial IC looks at half a dozen critical factors to determine the best course of action for the initial operation. For structure fires these factors include size and height of the building, occupancy type, fire size, extent and location and available resources.

The fast-attacking IC should conduct a 360-degree visual size-up to determine if the building has a basement or other levels not visible from the front of the building. This is an absolute requirement for communities with basements and/or buildings with a different set of levels from the front to the rear (as an example, two-stories showing on the Alpha Side with three stories on the Charlie Side).

Prefire Plans

Prefire plans provide critical-factor info in a standard format. In some instances this information would take too long to discover or would be impossible to obtain otherwise. This information is usable to the extent that we can access it quickly. Routing and hydrant maps are invaluable and should be referred to whenever possible. The crew should know the route to the address prior to responding. Because fast-attacking ICs operate in the hazard zone, it is difficult for them to access and use prefire plans beyond the initial response. ICs that operate in a strategic command post are in a much better position to use prefire plans to their full potential.

Managing Critical Unknowns & Red Flags

Critical factors provide a standard inventory the IC must consider. We begin incident operations with incomplete information. As the incident operation progresses, the IC must discover and verify this critical factor info. Most of these critical unknowns have to do with the seven (7) sides of the fire (the top, bottom, all four sides and the concealed spaces bordering them). The tactical benchmark of "fire control" for the entire incident scene should only be broadcast after the IC has verified all seven sides of the fire have been checked and verified as under control. In most structure fires, the fire area, attics and basements represent the three most critical areas. These positions must be covered during the initial stages of the incident operation.

Some incident unknowns have such a profound effect that the IC may assign a company to investigate. Examples of this include the status of the attic (particularly the attic space of large, wide-span wooden trusses, basements, and any other tactical situation with severe safety consequences).

Red flags are critical factors that demand immediate attention. They indicate potential problems that can adversely affect multiple crews and the entire hazard zone. This includes situations where there is an obvious fire but crews cannot find it, low-lying smoke that hides the building and reduces visibility to a few feet, and anytime the wind picks up. In many cases, the IC can make the red flag an assignment to a company. The IC must react to red flags.

Effective Size-Up Is the Platform for Reinforced Operations

The IC performs a quick size-up of the critical factors to initiate a response that controls/eliminates the incident problem(s). This initial response places two or three companies into key positions to determine the true scope of the incident problem, take effective action and then evaluate the results. If the major incident hazards still exist after the deployment of these two or three crews, it represents the major reason we must transfer command to an IC who will operate in a strategic position (upgrading command from initial operations to reinforced). A strategically positioned IC's major responsibility is never-ending situation evaluation anytime firefighters are operating in a hazard zone. This is the strategic IC's major firefighter safety responsibility. BS

Deciphering the Dress Code

As the formal vs. casual debate rages on, ask yourself whether your uniform *really* impacts your competence.

BY JOHNNY PETERS

ILLUSTRATION KEITH ROBINSON

Of all fire-service traditions, is there any prouder than dressing up? I get a special thrill as I fix my gleaming badge to my shirt, pushing the needle through the slots designed for its glorious passage, then carefully centering my name badge over my right pocket. I get a rush when I fasten the collar brass, using the holes worn there from previous performances of this proud ritual. I like to think those holes are comparable to the path worn by our brave fire-service predecessors, whose example guides us to the proper place on the collar of our careers.

So as not to prematurely wrinkle my pristine symbol of office, I hang my shirt in my Jeep, angled so that it will not interfere with checking my blind spot. When I back into a parking spot at work in the early morning, the sky is still dark. I reach into the back of my Jeep and grab my coffee. I know my shirt will hang there faithfully, waiting to greet me in the morning, with a wink of early sun reflecting from my shiny badge.

Now, if you are horrified by the thought of my button-up shirt—with its flair and regalia—sitting in a locked car like some abused dog, you might think I'm making fun of you. I am not making fun of you. You are fun. I am merely observing it.

Buttoned Up or Dressed Down?

There's been a uniform battle in my department for years. Some people really want the button-up shirts with the badges and the pieces of flair. I have distilled their position to these points:

- I worked hard for this badge, and I want to wear it.
- We need to be easily identifiable to the people.
- We are not garbage men.
- You are a slug.

There are, of course, degrees of commitment to the wearing of button-up shirts with brass and suchlike. There are those who think it's the proper

uniform and it looks professional, and then there are a few *true believers*. They get misty-eyed when looking at ancient photographs of men wearing six to seven layers of shirts, hats, cravats, honor knots, and so on. Nobody in those pictures ever looks happy. I think that tells me something.

On the other side are those firefighters who want to be less formal. Their case, in brief:

- I want to be comfortable.
- People can read "Fire Department" on my T-shirt.
- Some of my best friends are garbage men.
- You're a Luddite.

I've had ample opportunity to ruminate on the uniform issue. I fall a bit in the middle; I'm like Switzerland. I like my button-up shirt. Mainly, I like how it hangs in my vehicle. I've worn it most of my career, and it hasn't killed me. I'll wear pretty much whatever they issue me. In fact, I have purchased both of my previous badges and collar brass.

> No uniform of any sort will replace competence & courtesy. We aren't lawn ornaments.

I am proud of my job. I love my job. I think it's really the bestest. I am the sort who will "work" off duty. I firmly believe that's part of the bargain of being a firefighter. I feel obliged to bestow upon humanity my special abilities. To my mind, firefighters are never really off duty. I am also proud of the badge, but only for what it represents. To be proud of the badge itself would be idolatry. You don't want to be an idolater, do you?

Now, a little context regarding those paleo-firefighters in those old pictures. In the early years of the modern fire service, the people who made clothes were pretty much the most powerful people in the world, and they were aided and abetted by people who believed that skin was evil and should be covered. People bathed in more clothes than we wear to black-tie galas. Nobody was naked. Ever. The current button-up shirts worn across the fire service would have elicited horror, and you would have been put through trial by ordeal, found guilty of witchcraft, and burned at the stake.

My point here is this: Times change. Styles change. Definitions of professional appearance change, and they are all subjective. I have my own personal likes and dislikes. I think shorts look ridiculous as part of the work uniform, and that ball caps do, as well. If these become part of the uniform, I won't like it, but I am the Light Brigade.

Dress for Success! Or Slaughter...

Then again, the unexamined life is not worth living. Questions are good. The relevant question in all this isn't whether we should be more or less formal in our uniforms, but instead, what is the purpose of our uniforms? When I ask myself the purpose of uniforms, I come up with these things: identification, discipline and public relations.

To the end of identification, we do need a readily identifiable uniform. Badges and regalia indicate authority. But our function (as we relate to civilians) isn't really to serve as authority figures. People listen to us not because we have tasers or handcuffs, but because we are viewed as experts in keeping people in the not-dead category. The most harried scenes in the fire service are working fires and assorted disaster-type things, where we tend to wear charred, battered helmets and unreasonably filthy gear. People listen. They get out of the way. Kids wave, womenfolk swoon.

A few years ago, an engine company went to my daughter's school for a PR visit. The students repeatedly confused the men in the Class A shirts with cops. I myself have gotten police discounts in my button-up while my more comfortable crewmembers in their polos paid full price. (The fools!) I don't get it. I don't think we look like cops, but I'm not a civilian. If a bunch

of people in the safety of a public school or fast-food restaurant confuse us with police, then what of someone on the scene of a shooting? Do we really want to be confused with armed officers of the law? Not in *that* situation. It's a legitimate concern. So much so that I have in the past issued the order that anyone responding to a shooting or stabbing or other probably violent event remove the button-up shirt and go on scene dressed in a T-shirt. Back then, our T-shirts identified us in bold lettering as firefighters. Not many people shoot at firefighters. And you know what? Those scenes did not descend into chaos. The moon did not descend, burning from the heavens, to break upon the Earth and end all life.

The fire department's mission is to save lives and property. That is a simple statement, and it is inarguably true. To the extent that uniforms aid us in that purpose, they're good. When they neither help nor hamper, it's time to analyze. PR never stops. On scene, you're doing PR. But is PR our main function? Of course not; it merely serves our mission. It is done to *aid* us in saving lives and protecting property. If we look like dopes and slugs and layabouts, it will damage our image. If that image becomes commonplace, eventually the poor image will affect our budget, and then our morale. Then we will be less effective. But no uniform of any sort will replace competence and courtesy. We aren't lawn ornaments.

I concede that appearances are important. But we can all agree that firefighting is about more than appearance: "All hat, no cattle," describes a lot of people walking around in crisp uniforms. Our uniforms serve as *symbols* of discipline, not discipline itself. You can bluff your way through a lot of this job with that uniform, but if you don't fill it with something more than a warm body, it will eventually collapse under the gravity of the job. Think of an empty hoseline. You can make the push with that nozzle in your hands, but when it comes time to work, if no water comes out when you pull back the bale, you ain't putting out any fire, cowboy. Your uniform will only get you in the door.

The badge will normally keep civilians from messing with you. It will make your firefighters do just enough to not incur your wrath. Leave your badge around as an experiment and see how many people follow its orders. It's merely a tool, like a halligan. It won't get up and work on its own. BS

How do you fill out your uniform? What are some of your favorite drills or individual training habits that prove your right to wear that badge? Visit my blog and tell me all about it.

Johnny Peters is a captain with the Houston Fire Department, and one of maybe five members who actually live in Houston. He is capable of hiding in an open locker for several minutes in order to frighten a co-worker coming out of the bathroom, but only uses his power for good.

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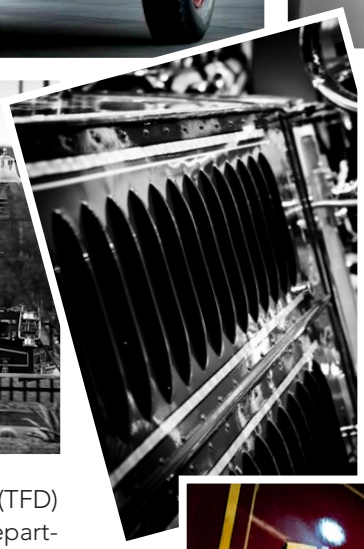
One Foxy Lady

The Tucson Fire Department restores a sweet 1928 Ahrens-Fox that's been with them for the long haul.

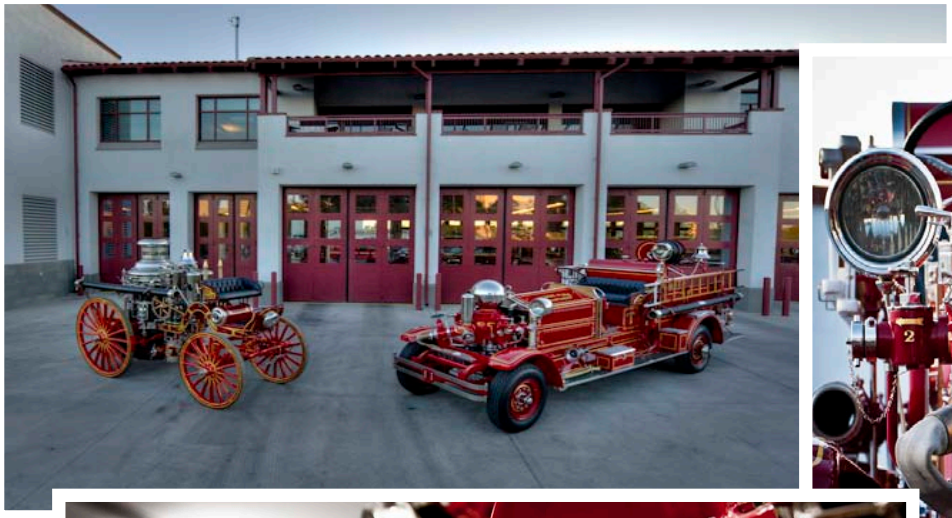
BY TED GEARE
PHOTOS BY SEAN STUCHEN



In January 2007, friends of the Tucson Fire Department (TFD) began the restoration of a 1928 Ahrens-Fox Pumper the department had ordered new in 1927. It has remained in TFD's fleet since that time. Originally purchased for $13,000, the truck represents the finest fire engines built during that golden age.

Restoring the engine from the frame up took a dozen dedicated volunteers 36 months. Their hours of expertise and commitment are evident to all who see the completed truck, a perennial beauty that graces TFD's Fire Central Headquarters.

All photos courtesy Sean Stuchen/www.seanstuchen.com. Reprinting or additional usage forbidden without photographer's consent.



Spec Check

1928 Ahrens-Fox Piston Pumper M-S-3

Engine
6-cylinder, gasoline type; 4 mpg
5.5" x 7" Bore & Stroke
997.85 cubic inch displacement
110 bhp. max brake H.P. (72.6 SAE rating)
Straight pipe exhaust system
12v electrical system

Transmission
3-speed manual with outborad shift lever on right running board
Non-syncromesh
Dry plate friction clutch

Steering
Worn gear, right-hand drive

Brakes
Expanding shoe, friction, mechanical (rear only)

Chassis & Body
Straight steel, I beam-style frame
Steel & wood body construction
Open-tuck cab body style

Pump
4-cylinder, double-acting piston
Positive displacement
750 gpm @ 120 psi
2 pistons left side (4.375" bore x 6" stroke—volume)
2 pistons right (4" bore x 6" stroke—pressure)

Suspension
Semi-elliptic leaf spring, front & rear
9.00 x 20 10-ply tires

Hoses
1,800 feet of 2.5"; 200 feet of 1.5";
20 feet of 5" hard suction; 10 feet of 4.5" soft suction

Equipment
24' wood extension ladder; 12' wood roof ladder
2.5-gallon water extinguisher
2 pick-head axes
4' crowbar
8' pike pole