Fire Engineering UNIVERSITY™

Continuing Education Course

Simulation Training: Decision-Making Aid

BY FRANK C. MONTAGNA

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Simulation Training: Decision-Making Aid

Educational Objectives

On completion of this course, students will:

- Gain an understanding of the basis for decision making on the fireground
- Identify the 15 points of size-up
- Gain an understanding of how simulations can help practice making fireground decisions
- Gain an understanding of how to develop electronic simulations

BY FRANK C. MONTAGNA

PULLING UP TO A BURNING BUILDING, YOU SEE fire and smoke. You are attempting to process an overwhelming amount of information as you view this dramatic scene. You note the smoke color, its location and intensity, as well as the flame's presence and characteristics. Apparatus engines race as they "go into pumps or raise ladders," and your firefighters call to each other as they gather their tools and approach the burning building. You receive additional information from dispatch as firefighters already on the scene feed you information over your portable radio. You consider the construction type of the building, the time of day, the weather, the resources you have on hand, and a host of other crucial items. As you do this, the sirens of incoming units wail in the background, and some civilians pepper you with questions while others try to give you information. You are the incident commander (IC).

This scenario occurs around the country on a daily basis, challenging senior ICs as well as junior ones. At the fire or emergency scene, the IC has only a short time to absorb all of these audio and visual inputs and more, interpret the varied inputs, and decide on a strategy and tactics that will safely extinguish the fire or mitigate the emergency and rescue trapped or overcome victims. If you think that this process takes the IC a long time, you are wrong. In his book *Sources of Power: How People Make Decisions*, Gary Klein[1] estimates that ICs make 80 percent of their fireground decisions in less than one minute. Even though ICs do not have all of the relevant information they would like to have before making these decisions, they must still make them, and make them quickly. In fact, you can honestly say that one of the jobs of the IC is to make quick life-and-death decisions based on incomplete information.

Amazingly, these decisions are usually good. Mistakes are made but, more often than not, the decisions are sound, the fires go out, firefighters are not injured, and victims who can be rescued are rescued. How do ICs accomplish this seemingly counterintuitive feat?

HOW FIRE COMMANDERS MAKE DECISIONS

A study funded by the military was implemented in an attempt to develop ways to train combat field commanders to make better decisions. The study looked at how decisions were made under stress. Fire commanders were among the groups studied, specifically how they make decisions at fires and emergencies. Klein, who participated in this study, found that fireground commanders do not compare various options, nor do they try to find the best possible option at a fire or an emergency scene. Instead, they choose the first workable solution they consider and subsequently alter this decision as needed to successfully conclude the incident. They do not consider all possible solutions and ramifications, nor do they consult with others on the scene. There is no committee formed to come up with an acceptable group decision. There is no time for that on the fireground. Decisions must be made immediately. Let us look at how fireground commanders are able to make these life-and-death decisions so quickly.

Klein points out that experienced ICs make better fireground decisions than inexperienced ones. This is no surprise, but why is it so? How do experienced ICs come up with a workable solution quickly? One reason offered is that they compare the present situation with situations they have experienced in the past. When an experienced IC sees a particular type of structural fire or emergency incident, he quickly relates the present situation with one previously experienced. He recalls the strategy and tactics that worked for him on that occasion, applies them to the current problem, and carefully watches for an expected outcome. If this expected outcome is not forthcoming, he reevaluates what is occurring and may try another tactic. This new tactic, again, is based on what worked for a previous incident with conditions similar to the current conditions facing him. It is as if he has a slide tray full of experiences he can quickly compare with the current fire or emergency. If one matches or is close, he applies the strategy and tactics that worked for him in the past. He does not have to come up with a new course of action for each incident. He makes his decisions seemingly without consideration.

(1) Fireengineering.com's Online Training Simulations.

The slide tray theory of decision making sheds some light on why experienced ICs make better decisions than inexperienced ones. They have more slides in their tray; as a result, they can quickly come up with workable strategies and tactics, because they need not invent them anew for each incident. The inexperienced IC, on the other hand, has a slide tray that is almost empty; as a result, he does not have many readily available options. Until such time as his tray fills up with useful slides, he has to invent a solution for each new incident instead of applying one that has been successfully applied in the past. He has a built-in handicap.

Assuming that the slide tray analogy is accurate, how do we help the new, inexperienced IC make better fireground decisions? If there were only a way to add slides to an empty slide tray! We could then give the inexperienced IC incidents to refer to when operating at an emergency or fire. Fortunately, there is a way. This seemingly daunting task can be accomplished by simulation training.

WHAT IS SIMULATION TRAINING?

What is a simulation? There are many kinds of simulations, and so there are many definitions. For our purposes, a fire or an emergency training simulation is a play depicting a fire or an emergency in which the instructor, using a prepared but flexible script, participates in a training play with a scriptless student.

The goal of the play is to allow the student to make life-and-death decisions without putting life or property at risk. The simulation should have defined training goals and create a certain amount of pressure or tension so that the student's decisions are made under pressure. In addition to decision making, the student is given the opportunity to practice fireground communications and use his knowledge of fireground strategy and tactics.

Simulation training is a method of training that gives ICs, company officers, and firefighters a chance to gain experience without encountering the associated risks of live emergency response. Firefighters have used a form of this type of training for as long as I have been a firefighter and, I am sure, well before that. I remember my lieutenant's drawing a rectangle on the kitchen blackboard, sketching in a few windows and a fire escape, and drawing a squiggly line at one of the windows to indicate smoke. He then proceeded to ask each of us what we would do and where we would go at an imagined fire in the crudely depicted building. It made us think about our assigned tasks, vocalize what we would do, and discuss with others what they would do. The lieutenant was conducting low-tech simulation training.

Looking at the drawing on the blackboard and seeing a building fire required some imagination on our part, but we managed it and became fully engaged in the drill. When it was over, we each knew what we would do at a fire in the depicted building, what everyone else would do, and why they would do it. The officer had run us through various fire progression scenarios, and we responded with how we would react to them. There was some pressure on us as we explained where we would go and what we would do. None of us wanted to look uninformed in front of our peers. The end result was that we had gained decision-making experience in the kitchen over a cup of coffee. We reviewed the tactics we would use and the actions we would take. No one was hurt, and mistakes were corrected immediately. We were definitely better prepared for our next fire.

Today, the military trains using high-tech simulation programs. The pilot, the tank commander, the naval officer, and the foot soldier all have intricate computer simulations that hone their communication and decision-making skills as well as train them to use the tools of their trade. These simulation programs are expensive and require quite a bit of technical skills to create and even to operate. Currently, most of this exotic technology is beyond the reach of the average fire department, but there are accessible alternatives. This means that firefighters, too, can benefit from computerized simulation training.

COMPUTER PROGRAMS

Several affordable computer programs are available today that will enable your department to use computerized training simulations. All you have to do is put your computer genius—every department has one or two—together with an experienced fire officer and an experienced trainer. Together, they will be able to create and run a computerized simulation that will give your firefighters, company officers, and ICs real-time communication and decision-making training. You can fill up their slide trays with the types of experiences you think they need. True, you are not giving them real smoke, no one is bleeding real blood, and real buildings are not burning, but it is real experience. If you consider a real fire to be a color photo in the slide tray, then simulation training can be thought of as putting a black-and-white sketch into the tray. Although not as detailed as the color photos, the sketch still supplies the IC with useful information to help him make good fireground decisions quickly.

Recognizing the benefit of simulation training, Pennwell Publishing, *Fire Engineering*, and Command Sim have collaborated to create computerized scenario training that is accessible to all departments. A free, easy-to-use computer-

ized fire simulation is posted each month on *Fire Engineering*'s Web site (www.fireengineering.com). These scenarios are not intended to be games. They constitute a ready-to-go training tool any fire department or fire company can use in the classroom or on the firehouse computer. It doesn't matter what your staffing is or what type of apparatus you have. You can use these simulations today to train your firefighters and officers. Simply go online to http://fireengineering.com/index.html and click on the simulation link (photo 1).

Previously, I mentioned that when I was a young firefighter, my lieutenant trained us with simulations using only a blackboard and chalk. It was low-tech but effective. The tools available to the instructor today are much more sophisticated, but the goal behind the training is the same—that is, to have the student make decisions on how he would respond to various fire or emergency scenarios. It is a useful tool for training all, from ICs to new firefighters. Naturally, you will have to alter the difficulty and even the structure of the scenario, depending on which group you are training and the lesson you plan to impart. There are a number of different ways to use simulation training. I will discuss a few of them.

USING SIMULATION TRAINING

Size-Up Simulation. A size-up simulation is easy to run, and it can be done right in the firehouse with little preparation. It need not be high tech. Simply show the firefighter a picture of a building fire and ask him to give his size-up. You can ask him to use the 15 Points of Size-Up contained in Deputy Chief Michael A. Terpak's book (Table 1)[2] or just let him brainstorm. It is a good idea to start with the junior firefighter first. The scope of his size-up will be limited, but the size-ups will become more detailed and comprehensive as you progress to more experienced firefighters. Ask the next senior firefighter for his size-up, ending with the most senior firefighter. Finally, have the company officer give his size-up, tying it all together by explaining his concerns for the depicted incident.

Table 1. The 15-Point Size-Up[2]

(Note: This list could be used as an answer sheet. Leave room between each point for the student's notes.)

1. Construction
2. Occupancy
3. Apparatus and Staffing
4. Life Hazard
5. Terrain
6. Water Supply
7. Auxiliary Appliances and Aids
8. Street Conditions
9. Weather
10. Exposures
11. Area
12. Location and Extent of Fire
13. Time
14. Height
15. Special Considerations

The whole crew gets to practice, but the junior firefighters are exposed to a more comprehensive size-up from the senior firefighters and officer. This process greatly expands the junior firefighter's size-up capability and overall fireground awareness. I used this type of simulation when I was a lieutenant. I projected a 35 mm slide of a building fire for one minute, after which I placed a book in front of the projector lens. Then, I asked each firefighter to give his size-up. I used the one-minute time frame, because that was how long I figured we had to get off of the apparatus and into the fire building. The size-up had to be made as we approached the building and needed to be done before we entered it. It worked well; everyone participated, and all gave thought to and practiced fireground size-up. The *Fire Engineering* simulations can easily be used in the same fashion. Show a stage of the fire, and ask for size-ups. After discussing the answers, show another fire stage and repeat the process.

If you have prepared a size-up for the photo or fire stage you are showing, you can check off each item as it is mentioned and, after all have had their turn, add anything that was left out. You can hand out a preprinted form with the 15 Point Size-Up listed; include a space for the firefighters to write their answers. This will help train your crew to consider all 15 points. If you have an abbreviated size-up you want them to use, hand that out. After all have had their turn, review the answers. Commend them for the good answers, explain why the incorrect responses are wrong, and provide any important details that are lacking. If using the *Fire Engineering* simulation, you will find that we have included a brief size-up with each of the posted simulations.

Tactical Size-Up Simulation. This, too, is a fairly simple simulation to run and can be used for all ranks. Let's look at how to use this type of simulation to train the firefighter. Show the firefighter a photo of a building fire and tell him that he is just arriving on the scene. Ask what actions he would take on arrival. He should describe the tools he will take, where he will go, how he will get there, and what he will do once he arrives at his destination. For example, if the firefighter is assigned to ventilate the roof, he might tell you that he is taking the saw and a six-foot pike pole and that he is going to get to the roof by way of the aerial ladder. Once he is there, he has to decide where to cut the roof and how to cut it. A roof photo would be useful at this point, but a chalk depiction of the roof would work fine.

Additionally, he should explain what radio reports he would give to his officer and the IC, if necessary. For example, he might report what the back of the building looks like or if there is fire in the cockloft. He might tell his officer that he has completed his assigned task or that he is unable to complete it. If he sees a victim at a rear window, he must report this.

Ask the ladder company's outside team where it would put ground ladders and the engine firefighters what size line they would stretch and to where. Let the apparatus operator explain where he would place his rig as well as how he would supply water or ladder the building. Question each firefighter in the unit. Again, start with the junior firefighter and end with the officer. This way each firefighter hears what the others are thinking about and what they are trying to accomplish. This will do wonders for the new firefighter by expanding his understanding of how each firefighter's task contributes to the overall operation. If a chief is present, he, too, can take part. His concerns and goals will give firefighters and officers a better understanding of the big picture with which the chief is concerned.

To train the company officer or chief officer using a tactical size-up simulation, show a fire photo and ask what strategy and tactics the officer would use. Ask how the company officer

would deploy his firefighters to achieve his assigned tasks. If the company officer is the first on the scene of the fire and acting as IC, what strategy and tactics would he implement? What information would he transmit to the dispatcher?

Where would the chief place his companies? What tasks would he assign them? What problems would he expect to encounter? What information would he want from his officers? What help would he anticipate needing to confine and extinguish the fire? Any rank can be trained using a size-up simulation simply by asking rank-appropriate questions.

You can also turn the training session into a safety drill by asking each firefighter what hazards he perceives and what hazards he might encounter as he performs his tasks on the fireground. What hazards would the forcible entry firefighter perceive? How about the roof firefighter and the nozzleman? What could they do to avoid or minimize the hazard?

Real-Time Fire Simulation. This type of simulation training gets really interesting and is only a little more difficult to orchestrate, but it requires some preparation. First, you will need a series of progressive fire photos. These photos should depict the fire as you would see it when you first arrive and the stages of progression to extinguishment. You can use as many photos as you want; you can do it effectively with four or five photos. This is where the *Fire Engineering* simulations really shine. They give you a detailed fire scene with a progressive series of fire stages represented—realistic fire and smoke and a variety of choices and special effects. These scenarios will engage your firefighters, making it much easier to get them into their roles in the simulation.

Let's use IC training as an example. The salient feature of this type of training is that you and the student engage in real-time fireground conversation. You, as the instructor, pretend to be the dispatcher, the company officer, and on-scene firefighters as well as the civilians, victims, and anyone else you can think of who might be interacting with the IC on the fireground. This requires an instructor who is thoroughly conversant in fireground communications, radio codes, fire tactics, and department resources—and who is a little bit of an actor. The better the instructor plays his roles, the more the students will get into the role playing and the more effective the training will be.

Alternatively, if you have the personnel, you can enlist a number of instructors to play the different parts, even use other students as role players—one each as the dispatcher, the engine officer, and the EMS officer. Each will need a script that includes the timing of the verbal prompts he is to give the student IC. In all cases, insist that the role-playing IC respond as if he were on the fireground. Don't let him ask you, the instructor, any questions. You, the instructor, are not there. You are one of the people on the fireground.

Keeping the student in character and running the simulation in a classroom setting in front of his peers puts the student under pressure. He will not want to look bad in front of his peers. As he becomes more ensconced into his role as IC, he will feel a degree of pressure as if the simulation were real. This pressure is a good thing. It gives him a chance to make fireground decisions under pressure. Although it is not as much pressure as he will encounter at a real fire, it is still pressure. Practicing under these conditions in the classroom will help him in the field where the pressure is real and greater.

Whether you are the only instructor or you have a cast of thousands, having a script will ensure that you do not miss a prompt. Plan in advance what you want to happen at the simulated incident, and ensure that other instructors are aware of your training goals. They need to know what you expect to occur so they can react accordingly to the student's actions.

You can nudge your student in the direction you want him to go by inserting visual prompts onto the screen while other prompts are relayed to the student verbally. For example, the fire scene may show a worsening or extending fire condition as you progress from one fire stage to the next. This will require a decision of the IC, and he will have to initiate some action. Should the student continue the attack or switch to a defensive strategy? Should he call for additional units?

Alternatively, you can relay this information by initiating a call from the truck officer in the fire building to the IC by prompting the student with this radio message: "Ladder 1 to Battalion 2, we have heavy fire in the rear of the building on the second floor, and it has extended to the third and fourth floors." The student would then have to react to it. He might have to contact dispatch and transmit an additional alarm. He might contact another on-scene engine company and assign it to stretch a line to the second floor rear. Again, all of this conversation should be done in character just as it would be done on the fireground.

When he calls the dispatcher, he will be talking to you, the instructor; when he contacts that engine company, he, again, will be talking to you. If you have multiple instructors, they can pepper the IC with radio messages. They can step on each other's radio transmissions. They can interrupt the chief with face-to-face communications. You can use real radios or just talk as if you were using the radio. With radios, you can stage instructors outside the training area, and they can transmit messages to the student IC in the classroom. The possibilities are endless.

As I have mentioned, you need a script. On it you will have the order of the various inputs or prompts you plan to give to the student as he relates to the photos or various fire states you show him. One problem you may face is that the student may initiate an unexpected action. You may have planned for him to pursue an interior attack, but he may order everyone out of the building or transmit another alarm before you want him to do it. You should let him make his own decisions, right or wrong. You may have to alter your prompts and radio transmissions based on the decisions he has made. You can, however, counter unexpected events by your prompts. If he is backing out prematurely, give him a radio message from the interior team stating that there is a missing member or that you have heard a victim calling for help or that a victim has been spotted at a rear window. This should force him to stay committed to an interior attack—at least temporarily. If he calls for additional help too early, simply delay its arrival or have the dispatcher indicate that the incoming unit was involved in an accident and will be delayed. After you have run several simulations, you become quite good at fielding the student's unexpected actions. Keeping the simulation on track can be challenging, but once you are

(2) Digital Combustion image. (Photo courtesy of Digital Combustion, Inc.)

comfortable with the process, it's fun.

By your prompts, you can challenge the student with any number of fireground problems. Anything that can happen on the fireground can be simulated by visual prompts, radio transmissions, or face-to-face communications. A civilian can walk up and tell you that his child is in the apartment over the fire apartment. A police officer can walk up and tell you that there is a report of a bomb in the building. You can transmit a Mayday message from a trapped firefighter or an urgent message from an engine company officer who has just lost water on the fire floor. A firefighter in the rear of the building can report a partial or impending collapse or a jumper in the rear yard. All of these prompts will require a response, a decision, and some action by the IC.

A real-time fire simulation enables you to challenge the student with decision making under pressure while giving him a chance to develop his fireground communication skills under that same pressure. It also tests his strategic and tactical knowledge as well as his knowledge of department protocol, communications, and resources. Simulation training can be used for informal or formal training as well as a portion of your promotional testing procedure. You can create a checklist of benchmarks you expect the student to meet and then rate his performance. Remember, however, that a student might deviate from your plan. This can be an error on his part, or he may come up with a better plan or action than you were expecting.

I have mentioned using the chalkboard, photographs, and the slide projector as simulation training tools. You can also use an overhead projector. You can even just go to a building in your district and conduct a simulation right there in front of the building. All of these will work, but today there is a better way. Because of the advances in computer technology, there are several computer simulation programs made for firefighter training. True, they are not as sophisticated as the programs used by the military, but they are better than the previously mentioned training methods, they are affordable, and they are within firefighters' technical capability.

Some of these programs allow you take a digital photo of a building in your area and add smoke and fire where you will. Using the program, you can show the student a building fire from start to finish. You can add special effects like changing smoke color, explosions, and sounds like breaking glass or the sound of the roof saw. You can add wind to blow the smoke in various directions. You can cause smoke to appear to rise from behind a building or from out of a window. You can put flames behind or in front of the smoke. Events like the appearance of smoke or fire can be set to enter the simulation on your time frame. By taking several photos from different views, you can simulate a walk-around or a walk-through the fire building. With the assistance of a photo-editing program, you can create clipart of your own firefighters, apparatus, and ladders and place them into the fire scene. You can insert videos and much, much more into the simulation.

The available programs, while not simple, are relatively easy to learn and use. You can get the basics of all of them relatively quickly, but those who are not computer geeks will need time to be able to use these programs to their full potential. The good news is that even at the most basic level, the programs can produce pretty good fire simulations. I am familiar with three such programs and they all will produce quality simulations.

SIMULATION PROGRAMS

Command Sim Fire - http://commandsim.com

This is the program used to create the *Fire Engineering* fire simulations posted on the *Fire Engineering* Web site. The program itself is an Adobe Flash add-in. That means that to install it, you must first have another program, Adobe Flash, installed on your computer. The simulation, once you create it, plays in your Web browser, or you can insert it into PowerPoint®. To create a simulation, you import digital photos of your intended fire building into the program and then drag and drop icons representing fire or smoke onto the desired location in the photo. Then preview how the effect will look in the simulation. If it does not give the desired effect, you can customize many aspects of the smoke such as color, height, width, density, turbulence, and much more.

After each change, preview how it will look and make any additional needed changes. The fire can be stretched or shrunk to the appropriate size. You can change the smoke and fire conditions when running the simulation by linking the change to button clicks, timing, or keystrokes. If you take the appropriate photos, you can set up a 360° panorama and have access to navigation controls that allow you to move around the photo as if you were walking through the scene or around the building. You can insert videos and clip art into the simulation, and there is a feature called "masking" that allows you to make the smoke or fire appear to be coming from behind a building or out of a

window. With it, you can control exactly where on the screen the smoke will show and where it will not show.

Knowledge of Adobe Flash will help you use the more advanced features, but it is not necessary. I learned how to use it without prior "Flash" knowledge. The finished product can be played on any computer that has the free Adobe Flash Player installed. Most computers already have this player installed and, as I said, it is free. To create simulations, you need the Adobe Flash program, which is not free, but you can run the scenario on any computer that has the free Adobe Flash Player installed.

Fire Studio - http://digitalcombustion.com/

Another program that I have used is Fire Studio. This program lets you create fire scenes by inserting fire and smoke onto your digital photo and then altering their characteristics. You can have up to four individual fire scenes on the screen at one time. This can depict the four sides of the building. You can show them all at once or one at a time. When you want the fire to progress to the next stage, you create a new slide with four pictures. It can be set up to run on a time schedule, and you can time events like a change in the fire or have smoke or an explosion occur automatically or by a keystroke. You can insert videos and a few animated characters into the simulation, and you will be able to control a number of aspects of the smoke and fire using masking to control where the fire and smoke appear.

You will need the instructor edition to create and play the simulation, but you can purchase the player edition and play the finished simulations without using the instructor edition. If you want to play the simulation on multiple computers, you will need multiple copies of the student disk.

You are given the option of changing the various simulation scenes into the .avi video format. This is how I like to use it. I convert each slide into an .avi file and insert them all into PowerPoint®. Then, all the instructor has to do is run the PowerPoint®. No special skills are needed. I have used several versions of this program; although the older versions are good, the most recent is by far the best. It is, however, a little harder to master, but it is worth the effort.

Code 3D - http://code3d.com

Code3D is different from the two previous simulation programs. As the name suggests, it is a digital three-dimensional program. In it, you can walk around a 3D city, even enter buildings or climb a ladder to the building's roof. You can put smoke and fire into one of several digital scenes included with the program, or you can build your own city or rural scene from the provided digital buildings, vehicles, animated people, and other scenery elements. As in the other programs, you can insert fire, smoke, and other hazards into the scene and control the way they look and behave. In addition, you can animate objects like fire trucks and people.

You can time events like the appearance or departure of fire or smoke, explosions, and responding apparatus or set them to keystrokes. The developers of this program can create, on request, buildings and scenes based on photos of buildings in your response area; the stock of available digital images has

(3) Screenshots from Code3D Free Simulation Software. (Photo courtesy of Code 3D/Sim Ops Studios.)

been expanding. Unlike the other programs, this simulation program is being offered as a free download on the Code3D Web site. The free Adobe Flash Player must be installed on your computer to run this program.

All three programs have a learning curve. To create good simulations, you will have to read instructions, take online tutorials, and play with the program. In all three programs, you can place, manipulate, control, and fine-tune fire and smoke effects to varying degrees. They offer different degrees of realism, online support, and instruction. Go to each program's Web site and carefully review the capabilities, costs, and support available before purchasing one. Look at the sample scenarios provided, and speak to people who are using the programs. Find out how they like them, how hard they were to learn, and how they are using them.

Each program has required computer specifications; so before you purchase one, check the required computer specifications against those of the computer or computers on which you plan to create and run the simulations. With Fire Studio and Command Sim, you can run the program over a network involving multiple players on individual computers at the same time. This type of simulation shows each player his individual view of the fire. For example, you could have one view for the IC, another for the Sector A commander, and another for the roof firefighter. Code3D plans to incorporate this feature sometime in the future. I have viewed but not used or created networked scenarios and will not comment on them in this article. For more information on network applications of the programs, go to the program Web site for information, or contact the developers.

Regardless of which simulation program you decide on, remember that the lessons being taught will make your people safer and that the simulations are simply training tools. These tools, combined with a competent instructor and willing students, will provide a superior training experience for your entire department.

Whether you are going to purchase one of the simulation programs or plan to use *Fire Engineering*'s Web-based simulations, you will find that, with a little practice and preparation, you will be able to develop and use simulation training for all ranks. Your firefighters and officers will enjoy the training, you will fill up their slide trays, and safety and effectiveness on the fireground will be enhanced. The beauty of the *Fire Engineering* Web-based simulations is that you can use them today without purchasing any additional software. (You will need the free Adobe Flash Player on your computer.) In addition, you need not have any special computer skills to use the *Fire Engineering* simulations. Just print out the sample exercise sequence, read it, and you can start running the simulation.

Of course, the more you prepare, the better the simulation will be. Print out the "Building Size-Up and Critical Points," and you will have salient building features at your fingertips, as well as tips on how to run the scenario. Print out the "Scenario Notes," and you will have a description and picture of each scenario state, the activating keystroke, and a place to put your notes. Where possible, I have included links to related material that can help you make the scenario a more meaningful training experience. For example, in the December simulation, I included a link to the National Institute for Occupational Safety and Health (NIOSH) firefighter fatality report of a fast food restaurant fire in Texas. The report gives teaching points you can work into your scenario.

The *Fire Engineering* Web scenarios are intentionally generic. They are not dependent on the size of your department or on your staffing or tactics. By picking and choosing from the various options, you can customize any simulation. Over the next few months, scenarios with buildings that can be found in many if not most of your response areas will be posted. I think the simulations will greatly enhance your training and help you increase your fireground effectiveness and firefighter safety.

If you like these simulations, let us know by posting your thoughts on the Discussion Forum at http://www.fireengineering.com/forum/message.html?id=2234. Tell us how you are using the simulations and what type of simulations you would like to see in the future. ●

ENDNOTES

1. Klein, Gary. *Sources of Power: How People Make Decisions*. MIT Press, Jan. 1998 out of print, 1999 paper.

2. Terpak, Michael A. *Fireground Size-Up*. Fire Engineering Books. 2002.

● **FRANK C. MONTAGNA** is a battalion chief and a 38-year veteran of the Fire Department of New York (FDNY). For the past 20 years, he has served as a chief officer and is currently assigned to curriculum development at the FDNY Bureau of Training, creating training programs for chiefs, company officers, and firefighters. He has a degree in fire science from John Jay College, where he has taught fire science and management courses and is teaching a course based on his book ***Responding to "Routine" Emergencies*** (Fire Engineering, 1999). He is a member of the editorial advisory board of *Fire Engineering*, lectures on various fire-related topics, and is a contributor to *Fire Engineering* and *WNYF*.

Notes

Simulation Training: Decision-Making Aid

COURSE EXAMINATION INFORMATION

To receive credit and your certificate of completion for participation in this educational activity, you must complete the program post examination and receive a score of 70% or better. You have the following options for completion.

Option One: Online Completion

Use this page to review the questions and mark your answers. Return to **www.FireEngineeringUniversity.com** and sign in. If you have not previously purchased the program, select it from the "Online Courses" listing and complete the online purchase process. Once purchased, the program will be added to your **User History** page where a **Take Exam** link will be provided. Click on the *"Take Exam"* link, complete all the program questions, and Submit your answers. An immediate grade report will be provided and on receiving a passing grade your *"Certificate of Completion"* will be provided immediately for viewing and/or printing. Certificates may be viewed and/or printed anytime in the future by returning to the site and signing in.

Option Two: Traditional Completion

You may fax or mail your answers with payment to *PennWell* (see Traditional Completion Information on following page). All information requested must be provided to process the program for certification and credit. Be sure to complete ALL "Payment," "Personal Certification Information," "Answers," and "Evaluation" forms. Your exam will be graded within 72 hours of receipt. On successful completion of the post test (70% or higher), a "Certificate of Completion" will be mailed to the address provided.

COURSE EXAMINATION

1. In *Sources of Power: How People Make Decisions*, it is estimated that incident commanders make 80% of fireground decisions in less than:
   a. 30 seconds
   b. one minute
   c. 45 seconds
   d. 15 seconds

2. One of the jobs of an incident commander is to make quick life and death decisions based upon:
   a. an overload of information
   b. detailed information
   c. fuzzy information
   d. incomplete information

3. In a study about military-funded study about how decisions are made under stress, it was found that fireground commanders do not compare options nor do they:
   a. consult other officers
   b. find the best possible option
   c. wait and see
   d. delay transfer of command

4. Experienced fireground commanders often make better decisions than inexperienced ones because:
   a. the large amount of experience from previous situations can be applied to the present situation
   b. the inexperienced officers are less interested
   c. the experienced officers pay more attention to details
   d. the inexperienced officers are from a different generation

5. The analogy that the author uses to express the repository for past experiences is:
   a. a trash can
   b. a filing cabinet
   c. a computer
   d. a slide tray

6. The script used in simulations must be:
   a. prepared but flexible
   b. prepared and rigid
   c. improvised and flexible
   d. scriptless and flexible

7. One of the original low-tech simulation aids described in the course was:
   a. the overhead projector
   b. handouts
   c. the blackboard
   d. the etch-a-sketch

8. How many points of size-up are identified in Michael Terpak's book, *Fireground Size-up*?
   a. 12
   b. 10
   c. 15
   d. 18

9. In earlier size-up classes, the author would project a slide projector image and give the students how long to size-up the building?
   a. 30 seconds
   b. 45 seconds
   c. 1 minute
   d. 1 minute, 30 seconds

10. When conducting a tactical simulation, firefighters should identify how they will get to the task, how they will perform it, and:
    a. what orders he will follow
    b. what apparatus he will arrive on
    c. the tools he will take
    d. what his riding position is

11. Which of the following is *not* something a roof firefighter would tell his officer via the radio?
    a. there is fire in the cockloft
    b. he has completed his task
    c. he sees a victim in the rear of the building
    d. he is ready for water

Simulation Training: Decision-Making Aid

12. When questioning each member of the company about their responsibilities, the trainer should start with the:

a. junior firefighter
b. officer
c. the engineer/chauffer
d. the senior firefighter

13. Which is not a question that would be asked of a chief?

a. Where would he place his companies?
b. What tasks would he assign them?
c. What information would he want from his officers?
d. What tools would he order to be deployed?

14. In a real-time simulation, the author states that the trainer plays the role of:

a. dispatcher
b. company officer
c. victim
d. all of the above

15. Keeping a student in character in front of his peers:

a. puts pressure on him
b. makes it easier
c. allows the instructor to be asked questions
d. lets the student play multiple roles

16. A message like "Ladder 1 to Battalion 2, we have heavy fire in the rear of the building on the second floor, and it has extended to the third and fourth floors." transmitted to the student acting as Battalion 2/Incident Commander would:

a. force him to ask for the message to be repeated
b. force him to ask for more information
c. force him to react
d. force him to transfer command

17. The real-time simulation script will have:

a. calls for a rapid build-up of fire
b. call for a building collapse
c. call for an explosion
d. prompts for the trainer that relate to the photos being shown

18. Simulation training can be used for formal training, informal training, and:

a. public education
b. promotional testing
c. code enforcement
d. company assignment

19. The *Fire Engineering* simulation program is known as:

a. Command Trainer
b. Command Sim
c. Command Officer
d. Computer Command

20. A three-dimensional simulation program is named:

a. Command 3-D
b. Computer Command 3-D
c. Command Code 3-D
d. Code 3-D

Notes

Simulation Training: Decision-Making Aid

PROGRAM COMPLETION INFORMATION

If you wish to purchase and complete this activity traditionally (mail or fax) rather than Online, you must provide the information requested below. Please be sure to select your answers carefully and complete the evaluation information. To receive credit, you must answer at least six of the eight questions correctly.

Complete online at: www.FireEngineeringUniversity.com

PERSONAL CERTIFICATION INFORMATION:

Last Name (PLEASE PRINT CLEARLY OR TYPE)

First Name

Profession/Credentials License Number

Street Address

Suite or Apartment Number

City/State Zip Code

Daytime Telephone Number with Area Code

Fax Number with Area Code

E-mail Address

TRADITIONAL COMPLETION INFORMATION:

Mail or fax completed answer sheet to
Fire Engineering University, Attn: Carroll Hull,
1421 S. Sheridan Road, Tulsa OK 74112
Fax: (918) 831-9804

PAYMENT & CREDIT INFORMATION

Examination Fee: $25.00 Credit Hours: 4

Should you have additional questions, please contact Pete Prochilo (973) 251-5053 (Mon-Fri 9:00 am-5:00 pm EST).

❑ I have enclosed a check or money order.

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Please provide the following (please print clearly):

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Signature

ANSWER FORM

Please check the correct box for each question below.

1.	❑ A	❑ B	❑ C	❑ D	11.	❑ A	❑ B	❑ C	❑ D
2.	❑ A	❑ B	❑ C	❑ D	12.	❑ A	❑ B	❑ C	❑ D
3.	❑ A	❑ B	❑ C	❑ D	13.	❑ A	❑ B	❑ C	❑ D
4.	❑ A	❑ B	❑ C	❑ D	14.	❑ A	❑ B	❑ C	❑ D
5.	❑ A	❑ B	❑ C	❑ D	15.	❑ A	❑ B	❑ C	❑ D
6.	❑ A	❑ B	❑ C	❑ D	16.	❑ A	❑ B	❑ C	❑ D
7.	❑ A	❑ B	❑ C	❑ D	17.	❑ A	❑ B	❑ C	❑ D
8.	❑ A	❑ B	❑ C	❑ D	18.	❑ A	❑ B	❑ C	❑ D
9.	❑ A	❑ B	❑ C	❑ D	19.	❑ A	❑ B	❑ C	❑ D
10.	❑ A	❑ B	❑ C	❑ D	20.	❑ A	❑ B	❑ C	❑ D

COURSE EVALUATION

Please evaluate this course by responding to the following statements, using a scale of Excellent = 5 to Poor = 1.

1. To what extent were the course objectives accomplished overall?	5	4	3	2	1
2. Please rate your personal mastery of the course objectives.	5	4	3	2	1
3. How would you rate the objectives and educational methods?	5	4	3	2	1
4. How do you rate the author's grasp of the topic?	5	4	3	2	1
5. Please rate the instructor's effectiveness.	5	4	3	2	1
6. Was the overall administration of the course effective?	5	4	3	2	1
7. Do you feel that the references were adequate?		Yes		No	
8. Would you participate in a similar program on a different topic?		Yes		No	

9. If any of the continuing education questions were unclear or ambiguous, please list them.

10. Was there any subject matter you found confusing? Please describe.

11. What additional continuing education topics would you like to see?

PLEASE PHOTOCOPY ANSWER SHEET FOR ADDITIONAL PARTICIPANTS.

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INSTRUCTIONS
All questions should have only one answer. Grading of this examination is done manually. Participants will receive confirmation of passing by receipt of a verification form.

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COURSE CREDITS/COST
All participants scoring at least 70% on the examination will receive a verification form verifying 4 CE credits. Participants are urged to contact their state or local authority for continuing education requirements.

RECORD KEEPING
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