

# Get out alive in 30 seconds!

## “Personal Escape Systems”



### **RESCUE ATTEMPT**

It's 2:00am, you're a lieutenant on a rescue squad returning from an alarm on the other end of the city when you notice smoke showing from a three story residential building. As you get out of the squad you are met by a hysterical woman who states her son is trapped in a bedroom on the third floor. Faced with an immediate life rescue situation, you transmit a first alarm and enter the building with your firefighter for an aggressive interior search. As you make the third floor you encounter moderate heat and smoke, you hear calls for help and locate an adult male in a rear bedroom. As you prepare to remove the victim, the hallway lights up forcing you back into the room. Second due companies are still enroute and fire is threatening your location.....

## **FIREFIGHTERS TRAPPED**

On January 23, 2005 the Fire Department of New York experienced one of its worst tragedies since 9/11. While searching for victims, six firefighters from Ladder 27 and Rescue 3 became trapped on the fourth floor of an apartment building. A rapidly extending fire on the floor below pinned them in the back rooms of one of the units being searched. With their primary means of egress to the stairwell cut off by fire and unable to access the rear fire escape due to make shift partitions in the apartment, the men were faced with the decision to either jump or burn to death. Intense heat at their backs forced the six firefighters to bailout nearby windows. As a result of the fall, two were killed and the remaining four received severe to critical injuries. Only one firefighter had a rope, which helped save his life and that of another firefighter. Since this tragedy FDNY has vowed to spend millions to reissue rope and equipment and conduct training that would help firefighters escape if they were ever faced with a similar situation.

## **TRAGEDY PLANNING**

Due to numerous tragedies in the fire service, Firefighter Survival and Rapid Intervention have come to the forefront of many departments' training programs. Since 1977 the number of fires and civilian deaths that occur annually in the United States has decreased by approximately fifty percent. Unfortunately this is not the same for firefighters. Over the last two decades the number of firefighters killed annually has stayed relatively the same, with the average being over 100 each year. As a result, more firefighters are being killed and injured per incident than ever before. With illegal renovations to older buildings, light weight construction, more flammable furnishings and buildings more tightly insulated – firefighters are faced with a greater chance of becoming trapped than they were in the past. As chiefs and front line officers, we have an obligation to ensure our personnel have the tools to do their job safely without hindering their aggressiveness when lives hang in the balance. The doctrine *“We will risk a lot to save savable lives”* comes into play here. A Personal Escape System is one tool that can protect the lives of firefighters when they put it all on the line to save the lives of others.

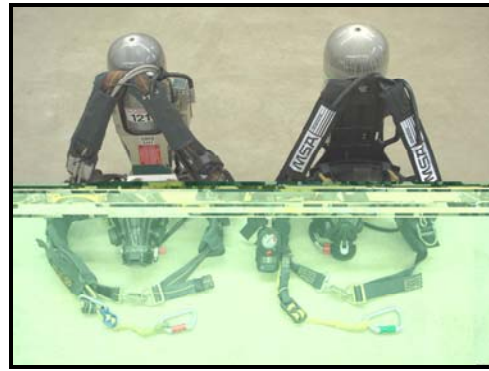
## **DECIDING ON A SYSTEM**

Ten years ago it was next to impossible to find a commercially made Personal Escape System. Firefighters who carried one, had to put individual components together which were often bulky and not designed for the rigors of fire fighting. Today, nearly every rope rescue manufacturer offers some type of Escape System. Due to advancements in technology – ropes and the associated hardware (carabiners and descenders) are smaller, lighter and stronger than ever. In today's world of tight and ever decreasing budgets, the cost of an Escape System might be the determining factor on whether to purchase one or not. This decision must be an informed one and requires an understanding of the options available.

For simplicity, Personal Escape Systems can be grouped into two main categories: An **Independent System** (Photo 1) and one that is **SCBA Integrated**. (Photo 2)



1



2

Each one has advantages and disadvantages. Both require some type of rope or webbing, an approved Harness or Escape Belt and hardware to secure to an anchor and attach oneself to his or her system. An **Independent System** requires a separate Class I or II Seat Harness or an Escape Belt. An **Integrated System** uses a converted scba waist strap as the Harness or Escape Belt – making it all inclusive. This may reduce weight and bulk, but could prove to be a disadvantage. Mainly, if firefighters had to exit a smaller window that required a reduced profile, they might be forced to doff their scba, which would make the Integrated System useless. An Independent System allows for more versatility and options for deployment. Additionally, Independent Systems allow for a wide variety of choices when it comes to harnesses/belts, rope, and hardware. This affords the opportunity to truly personalize a system based on a department's or firefighter's anticipated needs. Besides having the ability to customize, the purchase of individual components in large quantity can help to reduce overall costs. To further savings, Independent Systems can be located in riding positions on apparatus similar to SCBA Integrated Systems. The main disadvantage is proper maintenance. Firefighters are much more likely to keep their own system in good operational condition than one that is used by firefighters on every shift. A department's operational budget and the number of personnel may have an impact on this decision. Regardless of what type of system is chosen, all components must meet the requirements outlined in NFPA 1983 – Standard on Fire Service Life Safety Rope and Equipment. The 2006 revision is slated for release in the fall of 2005.

## TRAINING

Once a decision is made on the type and number of Escape Systems to purchase, the department must follow through with a training program. Step one is to stress prevention and teach firefighters how to avoid getting into situations that require the use of an Escape System in the first place. The hands on portion of the training must include the options and locations for deployment when the unavoidable occurs. It should also teach firefighters a variety of anchoring and bailout techniques, since no one technique will work in every situation or location. During the “hands on” phase of training, it is essential that Instructors utilize fall arrest protection to safeguard students who may lose control as they practice their escape and descent.

On both my departments and in a Firefighter Rescue and Survival Program that I developed and teach at a technical college, firefighters are instructed how to deploy a Personal Escape System not only out a window but off a flat or pitched roof as well. Advanced training includes the use of an Escape System to rescue a civilian or fellow firefighter in these same locations. We have found that through practice, a firefighter can completely clear out a double hung window, deploy his or her system and exit a room in 30 seconds. This is all while working in reduced visibility and using an Independent System. Techniques for rescuing a civilian or fellow firefighter out a window or off a roof can be executed in less than 60 seconds. Keep in mind that these times can increase when you add in the factors of heat, stress and fatigue that will likely be present in a real emergency. Experience is essential for a safe and effective operation, remembering that in demanding situations firefighters tend to fall back on their training.

## **A FAST ESCAPE**

The key to rapid deployment is having a preassembled system, knowing a variety of anchoring techniques and repetitive training. The safety, speed and efficiency of your escape will hinge on the type and location of the anchor you select. An anchoring technique that we developed dramatically reduces the time it takes for a firefighter to escape a hostile environment. This technique requires firefighters to carry a tool – ideally a flat or pick head axe or “Halligan” type bar. You must be in a room where the interior sheathing adjacent to the window is lath and plaster or drywall. When deploying the system, the firefighter pulls out the anchor end and slides a quick loop (figure 8 knot) over the handle of a tool. (Photo 3)



**3**

The handle of the axe or fork end of the “Halligan” bar is then inserted through the sheathing of the wall approximately six inches to one side of the window frame and twelve to eighteen inches above the bottom sill. When inserting an axe handle, face the blade of the tool away from the window opening. (Photo 4)



**4**



After breaching the wall, the tool is pushed up parallel to the wall, fracturing the sheathing above the breach. (Photo 5) The firefighter slides the tool down inside the wall as deep as possible, attaches the descent control device to his or her escape belt or harness (Independent Systems only) and rappels out the window. (Photo 6)



There are distinct advantages to this anchoring technique. First of all it is the quickest and easiest to perform, taking only seconds to establish. In addition, the anchor is installed right at the point of exit and low on the threshold of the window opening. This maximizes the length of the rappel, while minimizing the amount of rope exposed to any heat or fire that may enter or involve the room.

## **ANCHOR STRENGTH**

To evaluate the strength of this anchoring technique we performed numerous tests using various tools in both drywall and lath and plaster walls. In all tests the anchor easily held the weight of four firefighters without any movement of the tool. This is because the tool is wedged between the interior and exterior sheathing of the wall, locking it in place. During one training session conducted at a vacant building, a single anchor withstood over a hundred rappels without once being compromised. The strength of this technique allows the option for more than one firefighter to use the same tool. Due to the force applied, the use of wood handle tools should be avoided. Instead replace the wood with fiberglass or composite handles. Depending on building construction, the handle of the tool may breach the exterior sheathing of the wall; this requires retracting the tool to allow the handle to slide down inside the wall. On plaster walls, the lath must run at least two stud spaces (thirty two inches) in order for the wall to hold the tool in place. Otherwise the lath may simply pop off the studs when the tool is pulled down into the wall space. Drywall on the other hand has no space limitations.

If construction features prevent this anchoring technique, firefighters can resort to more traditional methods such as breaching a wall and wrapping a stud near the escape window or securing to a substantial object in the room. As a last resort, firefighters could breach the floor or place a tool in the corner of the window opening, preferably using a “Halligan” type bar.

A Personal Escape System can prove to be an invaluable tool for self rescue, but with additional training firefighters can learn to use an Escape System for the rescue of a fellow firefighter or even a civilian. A firefighter’s chances of survival increase proportionately with the equipment and options he or she has immediately available. The decision to provide our personnel with survival equipment becomes easier to justify when it has more than just one application.

## CONCLUSION

The fire service has a long history of tragedy planning. It often takes a firefighter to be seriously injured or even killed for us to reevaluate our policies, procedures or equipment. If we believe the safety of our personnel comes first, this “after the fact” mentality needs to change. The bottom line is this – If firefighters are expected to push the envelope in order to save lives and get people out of burning buildings, we need to give them the tools and training to do their job safely so they can get out alive as well – and money should never get in the way of that!

.....you and your firefighter locate a window and clear it out. With the bedroom door closed, you prepare to lower the victim out the window with your Escape System. As the victim is extracted, your firefighter deploys his System and completes his escape. Once on the ground, he releases the victim while you deploy your System for self rescue. As you reach the ground, second due companies begin to arrive on scene. You look up to find the room you just bailed out of fully involved in fire.

Dale Pekel is a 15 year veteran of the fire service; he is a Lieutenant currently assigned to Rescue 1 in the City of Wauwatosa, WI. He also serves as a Captain and Training Officer for a paid on call fire department. He has an Associate Degree in Fire Science, is a State Certified Level II Fire Instructor and teaches at Fire Training Centers in both Milwaukee and Waukesha County. He is a Certified Divemaster and Technical Rescue Specialist with thousands of hours of training experience. He created and is the lead Instructor of H.E.A.T.T. (High Emergency Advanced Tactics Training) – a 56 hour Firefighter Rescue and Survival Program taught on the campus of Waukesha County Technical College. For additional training information, he can be reached at [ffdpek@aol.com](mailto:ffdpek@aol.com)