



THINK SAFETY

by

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The fire occurred in a large commercial building in the heart of the business district. No fire could be seen from the street, and very little smoke was coming from the building. Inside, the volume of fire was nothing that the normal standard operating procedures of first alarm units could not have handled. However, whatever was burning produced incredible amounts of dense, black smoke. All those not actively involved in putting water on the fire, or stretching back-up lines, were used to search the fire floor, shut down the sprinkler control valves, and open arteries through which the blinding smoke could be channeled from the fire area. The fire was extinguished and the situation under control thirty-five minutes after the first firefighting units arrived on the scene. To repeat, this fire was nothing out of the ordinary for these units, however, the cost of the successful completion of their mission was very expensive. One firefighter died! When he was found, he was wearing his self-contained breathing apparatus (SCBA). The cylinder of his SCBA was empty, and his facepiece was on the floor next to him. The victim was a knowledgeable firefighter, with more than ten years experience. It is assumed that he became disoriented while searching the fire floor and, while attempting to find his way out, failed to find the exit. He had depleted the air in his SCBA, removed his facepiece, was overcome by the smoke, and died.

PERSONAL ALERT SAFETY SYSTEM

While the above account of a fire and its tragic result is fictitious, how many of you have been directly involved in a similar situation? For sure, you have listened to accounts relating to the loss of a firefighter. Try to recall the particulars of the situation if you can, especially the location of the victim in relation to those involved in searching for him, or those not even aware that a firefighter was missing. It seems that more often than not, the missing firefighter was within earshot of those who could have at least reached him had they known that he was down, or those who could have seen him, were it not for a heavy smoke condition. Almost certainly, a beeping or fluctuating shrill of 95 decibels emanating from a downed firefighter would have alerted at least one firefighter in the immediate vicinity to the fact that a brother firefighter was in distress, and allowed him to "home in" on the victim quickly.

In the near future, all New York City Firefighters

will be equipped with just such a device. This device will be capable of alerting those in the immediate area to the fact that a firefighter is down and in need of help. This device is known as a Personal Alert Safety System (PASS). It is also called a Personal Distress Device and a Personal Distress Locator.

As of this writing, the decision has not yet been made as to which PASS the New York City Fire Department will purchase. To date, none of the PASS's comply with a standard that has been published by the National Fire Protection Association. However, two devices are very close to compliance. Since their compliance appears imminent, all concerned feel justified in delaying the purchase of any of these devices until this standard is met.

Background. Early in 1980, the Research and Development Unit began its search for a PASS that would be suitable for our firefighters. At that time, there were at least seven producers of these devices who allowed us to evaluate their product. In-house tests were conducted, and any problems that were found were referred to the manufacturer with a request that they modify their device. Some manufacturers expressed an interest in working with us toward the production of what we felt would be an effective piece of equipment, while others were either satisfied with their product as it was, or were simply not prepared to commit themselves to a project that could possibly yield a "no sale" to the New York City Fire Department.

General Description. The PASS is slightly larger than a package of king size cigarettes, and may not weigh more than sixteen ounces with the battery installed. Generally, it weighs less than the sixteen ounce maximum. These devices are powered by a 9 volt alkaline battery. Pilot tests conducted by various units of the Department, under actual firefighting situations, indicate that the battery will not require changing more than once or twice a year.

The case of the PASS is made of Lexan, which is very strong. It will resist damage as a result of being dropped or being struck by another object. The case must be capable of supporting 442 pounds on each surface without having its integrity affected or showing any visible damage. It must be capable of surviving a total of twenty-four drops to a concrete floor from a height of 9.9 feet, sounding the alarm after each drop. These twenty-four drops are conducted in three series



Photos by R. Smioutkas



Above: Fr. Pontecorva enacts roll of unconscious firefighter to illustrate use of PASS unit to Fire Department dignitaries and the press at City Hall demonstration held on January 26, 1984. Left: Capt. Eugene Richardson (co-author of "Think Safety") and Ass't Chief Carlos Rivera examine PASS units as Fr. Pontecorva looks on. The Chase Manhattan Bank donated well over \$100,000 to purchase 2,700 of these units, which will be used by New York City Firefighters.

of eight drops each. One series of eight drops is conducted after preconditioning the device for a period of four hours at 77° F. Eight more drops are conducted after a four hour preconditioning period at -45° F, and the final eight drops are conducted after a preconditioning period of four hours at 160° F.

The switch shall be rated for a service life of not less than 50,000 cycles. It shall allow for operation in three modes: Off, Manual, and Automatic. Simply stated, the PASS must be capable of being placed in full alarm by the manual, as well as the automatic, operation of the switch.

The PASS will be attached to the waist strap of the self-contained breathing apparatus by a clip that will secure it to a specific position (preferably more toward either hip than toward the center of the wearer's body). Once the waist strap is buckled and pulled snug around the waist, there is practically no chance of losing the PASS.

HOW IT WORKS

Immediately after turning the PASS on, you will receive a momentary audible signal indicating that the unit is in working order. That's all there is to the operation of a PASS. It will remain quiet just as long as the wearer continues moving. Should the wearer of a PASS remain motionless for twenty to thirty seconds, the PASS will emit a prewarning signal for four to ten seconds and then go into full alarm. Since there are times when a firefighter might remain motionless for twenty to thirty seconds, he/she might experience this prewarning signal. All that is necessary to recycle the PASS is for the firefighter to simply move his/her body, or move the device. The motion caused by either of these acts will end the prewarning signal and recycle the device to its normal operating (automatic) mode. In the event too much time has elapsed between the start of the prewarning signal and the movement that

would recycle the device allowing it to go into full alarm, simply turn the operating switch to the off position and then immediately back to the automatic mode. Should a situation occur where a firefighter recognizes the need for help, he/she can manually activate the PASS to full alarm.

A constant nonfluctuating tone from the PASS indicates that the battery power has been reduced to 80% or less and, therefore, should be changed. If the low battery indicator should sound during an operation, do not turn the unit off. The sound is a low level sound, not annoying, and cannot be mistaken for a full alarm. While signaling a low battery, the PASS is still capable of emitting the full alarm signal for at least one hour; should there be a need. Tests have been conducted where PASS units equipped with batteries with 80%, or less, power emitted the full alarm signal of 95 decibels for as long as ten hours. In any event, when receiving a low battery indication, be sure to change the battery when you return to quarters.

How Loud is 95 Decibels? Sound has both frequency and intensity. Frequency, or pitch, is measured as sound vibrations per second, or hertz. The frequency of a train whistle or a ship whistle is about 250 hertz, while the frequency of a bird singing or a table saw is 4,000 hertz. Intensity, or loudness, is measured in decibels. A conversational voice is about 65 decibels, while a shout is 90 decibels or more. The sound of a PASS is measured at 95 decibels at a frequency of 2,000 to 4,000 hertz, and is more comparable to a table saw than to a bird singing. Be assured that the sound of a PASS is easily discernible and not pleasant to listen to.

CONCLUSION

A properly used and maintained PASS is, without a doubt, a boon to the fire service. It could very well be acclaimed the greatest benefit to firefighters since the advent of the self-contained breathing apparatus.