White Paper

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Reducing Evacuation Time:

The Role of Directional Sounders

SYSTEM SENSOR®

It is important to quickly exit a building during a fire, because minutes, even seconds, could mean the difference between life and death. A fire alarm system plays a crucial role in alerting people to a potential threat, but once an occupant has made the decision to evacuate, the fire alarm ceases to fulfill a function. It is up to the occupants to find their way out of the building. They need to know how to quickly locate the nearest exit.

Most buildings use visual means to identify exits, usually signage, which can easily be obscured by smoke. As a result, the signs lose their value as a guide. In addition, the signs have little or no value to the visually impaired. What is needed is an audible exit sign, one which provides clear direction for building evacuation.

Industry Challenges

It is imperative that evacuation times be decreased during a fire emergency, in order to reduce or eliminate loss of life and/or injuries. Today's fire alarm systems notify occupants to evacuate or relocate via notification appliances or voice evacuation messaging; however, various situations can delay or hinder evacuation or relocation.

First, most building occupants do not start evacuation immediately, partly due to public apathy. Also, most people will try to determine what is happening before evacuating.

Second, human behavioral studies show that occupants tend to exit a building using the same door they entered, usually the front door. This is rarely the fastest exit, partly because this is the way everyone else is exiting, so the pathway is crowded and movement is slowed. Occupants may avoid nearby fire exits because of their reluctance to open a door they have never used, and because of their fear of not knowing where the door leads. As a result, not all emergency exits are utilized.

Third, egress routes in most buildings are identified by visual means, such as exit signage, which is often obscured, even when smoke levels are low. And signage has little or no value to those with impaired vision. Also, traditional signage can be difficult to spot in visually cluttered areas, such as airports or shopping malls, where exit signs have to compete with numerous other signs. Another problem with traditional visual signs is that they may become irrelevant to occupants who have seen the signage frequently. As a result, occupants may fail to use them in emergency situations.

Sound, an Obvious Solution

It became clear to System Sensor that reliance upon visual means is not good enough in modern evacuation practice. Another means to locate exits must be used, and the obvious solution was sound. Trials have shown that using sound speeds evacuation.

Placing horns or voice evacuation speakers over exit doors is not the answer, because occupants would not be able to locate them. Standard alarms and speakers use narrowband sound, which is excellent for alerting people to emergencies, but are difficult to locate. However, tests show that directional sound, which employs broadband low, mid and high frequency sounds, can be pinpointed by the human ear,

System Sensor's solution is ExitPoint,™ a self amplified speaker, which produces a pulsating noise consisting of broadband low, mid and high sounds. The broadband noise makes it possible for those in the building to determine the exact location of the sound, even if they are unfamiliar with the building or if the exit signs are obscured by smoke.

ExitPoint, which was improved in Spring 2007, now also includes voice messaging. The device is capable of playing a recorded alert message, which instructs occupants of the action to take as they approach an ExitPoint device. The instructions include "stairs up," "stairs down," "area of refuge" or "exit here." ExitPoint has a total of 15 single and combination language choices, including English, English/Spanish, and English/French.

The device features a number of field-selectable power settings, has a low profile, compact design, and is aesthetically pleasing. The ExitPoint PF24V directional sounder has an optional disable feature for use in conjunction with a relay module or heat sensor. It is listed to UL 464.

Conclusion

The solution to faster evacuation is System Sensor's ExitPoint with Voice Messaging, the newest concept in fire safety. The innovative device makes it possible for occupants, even those who have never before heard an ExitPoint device, to react quickly and confidently.

Trials using ExitPoint consistently show an improvement of up to 75 percent in evacuation times in smoky conditions and up to 35 percent when smoke is not present. This reduction in evacuation times could mean the difference between life and death for a building occupant caught in a perilous and frightening situation.

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