Evacuation! Understanding Behavioral Aspects of Emergency Response in Individuals

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Introduction

Human behavior during fire and emergency situations remains one of the areas often misunderstood, if considered at all. Even professionals who work daily to ensure the safety of building occupants have a very limited understanding of human response to emergency situations which they may face. If these professionals have a limited understanding of the concepts of human behavior in these situations, how can we begin to expect the owners of businesses and management to have even given the topic any consideration?

Information has been gathered over the last 50 years through various studies of building occupants and interviews or surveys taken from individuals who have been involved in major incidents. These range from psychological studies conducted in controlled environments to extensive surveys of survivors from incidents, including the World Trade Center attacks. These studies have given valuable insights into the behavior of individuals faced with survival, "fight or flight", recognized real life threatening situations. As relatively simple, and yet detailed, as this information is the lessons learned from these studies to this day largely remain tucked away in text and reference books awaiting the light of day to be discovered and the valuable information applied.

The most certain outcome of understanding this information will be the saving of countless lives by applying the knowledge and understanding of this most important aspect of human behavior. In a day and age when psychological studies support the marketing efforts of countless major corporations it is regrettable that we have not utilized the knowledge in the area of emergency response toward the preservation of our most valuable resource…people.   Most assuredly, countless lives could have been saved who today would be contributing and productive members of their communities if the knowledge in this area were being properly understood and applied. While we will never be able to fully know the true cost to our society, and even the world, for the tragedy of not understanding and applying this knowledge, rest assured, the cost should be considered a great one.

And so, in the time that we have available during this session, let us all learn what we can toward understanding this vital area of life safety. But more than that, we must take what we learn here

today, and seek opportunities to apply the principals of this understanding and effect changes in our approach to the safety of building occupants.

Background—A Short History
In the development of our codes, standards, and approach to life safety we have largely been reactive. When a major incident occurs, studies are conducted to determine what the cause of the large loss of life could have been, and then documents published to provide guidance, and even laws, to prevent the incident from occurring again. Such recognizable incidents as the Triangle Shirtwaist Fire, Cocoanut Grove Fire, Our Lady of Angels School Fire, Beverly Hills Supperclub Fire, World Trade Center Attacks, and The Station Fire, all have been driving forces in attacking the problem of loss of life from such tragedies. The speed at which a solution must be found after such tragedy is monumental. In reality, we have had the answers all along but just failed to apply the right formula. What have we know but failed to fully understand and implement for all of these years? Understanding the behavior of individuals involved in these events, and what must be done immediately and correctly when such incidents occur.

Awakening
After having been a good "student" of life safety and evacuation planning for many years, an awakening completely shook the solid ground I had been standing on for most of my career. Reading a quote from Neil Townsend, Divisional Fire Officer, London Fire Brigade, resulted in total disbelief at first, but the beginning of an awakening when I allowed myself to challenged what I had known for so long, that quote in just 22 words rocked my entire foundation, Thank you Neil…..

> "I think that when people die in fires it's not
> Because of panic—it's more likely to be the
> lack of panic."

Naturally after reading this statement I had to immediately disagree entirely with this theory. Have we not been trying to prevent and control panic in these situations so that people could safely and properly evacuate a building or area. And then I began to remember the accounts of many individuals in the World Trade Center who dutifully followed instructions, even orders to "stay put". Those who made it to the lobby of the building and were told "go back to your desks and wait" and did. Those who called to ask what they should do and followed those instructions to their death. They didn't panic….the calmly awaited their fate. Or at least we assume they calmly waited…if only they had allowed themselves to panic…just enough.

Understanding
OK, if panic isn't necessarily bad, just how does it apply to the evacuation of building occupants? Where does it rightly and wrongly fit into the equation of planning and executing building evacuation plans? Great question! Before we explore the human behavior process, we should firs understand some basic, but important concepts.

The development of a comprehensive evacuation plan will involve considerable time and effort. And, if we are fortunate, may only have to be used once during the lifetime of a building or business if at all. And yet, when needed, the development, testing, drills and planning will be invaluable to each and everyone affected.

Another reality to be understood involves case study investigations of incidents in healthcare occupancies. The study concluded that the period between detection of the fire and the arrival of the fire department is the most crucial life saving period in terms of the first compartment. In other words, those who were in the compartment of fire origin survived if they were able to evacuate prior to the fire department arrival. Most certainly this reality could be true for most all occupancies.   What does this mean in our 911 world of today, a world where all we have to do is dial 911 and all the help arrives immediately and everything turns out fine? It means that we are depending entirely too much upon the public emergency responders to handle these emergencies, often with little forethought or preparation by those who are really responsible for the building occupants, the owners and management of these properties.

In the aftermath of the 2001 World Trade Center tragedy I visited a number of high-rise properties to talk with the managers and building occupants about their understanding and comfort level with evacuation. From the management side responses seemed to be relatively neutral…with comments like "oh, that won't happen here" and "we've never had a problem like that before". However, from talking with the people who daily worked in high rise buildings, there was a different attitude. They wanted guidance and to know that their building had a plan for their safety in any type of emergency situation.

Behavior Response—The Core of the Matter

Now that we have some basic understanding just exactly what is meant by the behavioral response of individuals involved in evacuation….or the "right" panic. It is more than just a response it is a series of responses that result in an entire process. Each individual goes through this process that involves, essentially, six very basic steps. Some are relatively simple, and some are very, very complicated…or can be. What are those six basic steps, they are, in order: **Recognition, Validation, Definition, Evaluation, Commitment, and Reassessment.** That's it….those six steps tell the entire story, and have been well documented from multiple studies. How does each of these steps play a part in the individual's evacuation process? At this point, it may be better to ask "why are these steps important to the development and implementation of evacuation plans, and even codes and standards?" An exploration of these six psychological responses will answer both questions. So let's begin.

Recognition: This is the starting point in our behavioral response, the point at which our process is set in motion. Essentially all this really means is that something in our environment triggers our attention, something isn't right or normal. An odor, possibly flame, the sound of an alarm, shouting, screams, any number of initiation points could trigger our initial recognition response. These can be somewhat ambiguous; nevertheless, these are the cues which give us our first indication that a fire (or other incident) requires our attention. Often we relate our prior personal experiences to the information presented during this phase. Many psychological factors will influence our recognition phase. Any feelings of invulnerability to the perceived risk will have an impact upon this first step of our reaction. This presents a problem for those involved in fire protection and incident planning. Some occupants my have to be presented with a significant amount of threat—smoke, flame, etc.—before the will react at this phase. While others may respond quickly to the slightest stimulus.

Validation: As evident from the term, validation is the step where the individual attempts to validate those initial perceptions of the information collected during the recognition phase. The

data collected is validated against the individuals' current situation compared to historical information and past circumstances. Often attempts are made to collect additional information if these cues or initial information is ambiguous in nature. Simply put, validation creates a moment of reasoning where the perceived elements of a situation are confirmed and this information is then utilized to move into the next phase.

Definition: When recognition turns to validation, the next step is to define the situation. Information collected is related to the situation. At this point the individual begins to assess their relationship to the incident. Information is needed for immediate questions of the individual's location in relation to the incident. Often stress and anxiety can be most severe before the situation is defined. Factors of major concern to the individual at this time include the generation, intensity, and propagation of smoke, flames, thermal exposure and other possible threats. At the definition stage the individual is beginning to define their situation and the potential impact upon their survival.

Evaluation: This phase becomes the point where the individual will begin to formulate their response to the threat. Development of strategies, including alternatives, to cope with the situation are created. These responses are designed, through psychological and physiological methods, to reduce stress or anxiety and induce preparation for the steps to be taken. The, "fight or flight" decision is made during this phase of the response. Because of potential rapid escalation of the incident, this process may have to be determined within a few seconds. At this time communication to occupants is critical for them to evaluate their situation. Factors include the location of the individual in relation to the incident, the location of other occupants at risk, potential untenable effects of the incident, response by other members of the exposed population. It is common during this phase for individuals to begin to react to the other members of the population. One possible outcome is mass behavior (adaptive or no adaptive) as compared to selective individualized behavior.

Reward elements can include a successful outcome, all individuals finding and utilizing emergency exits to reach a place of safety. In theory, all should be able to reach and utilize these exits. If there are factors which are perceived to make safe egress competitive then it is likely that this individual approach will become the norm for the group of occupants in any given area. Occupants who are familiar with the building or area are more likely to react differently than those who are unfamiliar. Studies have shown that it is more common for individuals familiar with a building to engage in fire fighting actions and assisting with the notification and assistance of other occupants. Those unfamiliar will usually seek evacuation of the building or area as their first choice. Both of these initial decisions can be impacted by new information, as we will see in further examination. New information can result in individuals reverting to the opposite of their original choice. Utilizing this information to understand your building occupants will result in better pre-incident planning. If a building has a large population of familiar occupants you may not want the majority of occupants to seek to resolve the situation, say by utilizing first-aid fire fighting practices. However, if a building is largely occupied with unfamiliar occupants, depending upon them to use the fire extinguishers may be a wrong assumption.

Commitment: This phase is where the individual process is where methods are utilized to achieve the behavioral strategies that have been formulated during the evaluation process. This may result in complete success, partial success, or complete failure in achieving the intended objective. If the outcome is not successful the individual will immediately begin to involve

themselves in the process of reassessment. Should success in the implementation of the commitment be achieved, the anxiety and stress created due to the situation are relieved for the individual, regardless of the outcome of the incident. Commitment is where the psychological reaction meets response. Actions are taken at this point.

Reassessment: This may be the most stressful of the phases involved in the behavioral response. If previous attempts have failed the individual struggles with the potential outcome. Greater physical and mental energy is allocated and the individual tends to become less selective in the risk involved in the response. If multiple failures are involved the individual will become more and more frustrated, anxiety levels increase, and the probability of success decreases. In short, something has gone wrong requiring the reassessment, a new plan is needed. Should the next plan committed to be successful then the outcome is optimistic. However, with subsequent failures success is less likely and "bad panic" may occur. Intervention at this point is often critical if the individual becomes incapable of moving ahead successfully.

Application
For too long we have minimized the importance of human behavior in the development of codes, standards, and in the emergency planning process. This is changing, and for the better. However, we still believe that the occupants and employees of our buildings will respond in the way that the life safety requirements are dictated. Reality has shown us differently. Examples of altruistic behavior are common during emergency situations. Manny have died when they refused to leave a co-worker who was unable to evacuate. Believing that help would arrive, the unhindered stayed to calm and care for their friend, even acquaintance.

There are many examples of needless loss of life when individuals refused to respond to their own intuition, failed to panic if you will, and remained at their desks not knowing they were awaiting their deaths.

In the future if we are going to be successful at managing the evacuation of building occupants it will because we have allowed ourselves to begin thinking more in terms of how people behave, respond, and react to these situations. Everyone from code writers to those involved in the development of specific evacuation plans must approach their process from a greater understanding of the individuals, and not necessarily only the events they are planning for.

Conclusion

There remain many challenges in understanding the important area of pre-planning and human behavior to successfully evacuate building and business occupants. Many more lives will be saved if we can apply the understanding of human behavior to this process. This is not an end, but rather a starting point. When there is an understanding of the behavioral response to these situations you will be better able to properly plan and execute the safe removal of individuals from threats they face. By recognizing the elements of the behavior response, defining them in terms of the people and events we are planning for, defining what our mission and plan need to be, evaluation of our planning in terms of the behavior and outcome desired, making a commitment to rethink these plans and building occupants behavior, and reassessing our plan as the basic elements change, you will be able to plan for greater success in handling emergency events and the behavior of those involved.

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