



QUESTIONS AND ANSWERS IN REGARDS TO CODES

ANALYSIS OF IFC 316.3 AND IFC 316.5

INTRODUCTION

Human safety has always been an important topic. In recent years, building occupancy safety has gained prominence due to the current social environment. Building managers and owners are driven to implement defensive tactics to counteract incidents and keep their occupants safe.

Active shooter situations are unpredictable and evolve quickly. Eight to twelve minutes is the average amount of time an active shooter situation lasts inside a building. Many minutes may pass before authorities arrive on the scene to resolve the active shooter situation. Most security measures such as surveillance cameras, door locks, access controls, gunshot detectors, and bulletproof glass are passive attempts to protect occupants. Security guards can adapt and react to a situation; however, they are not perfect solutions either as multiple fatalities and injuries to security guards have occurred in the past two decades. In most cases of active shooters in school buildings, either the shooter who committed the violence ended the event by committing suicide, or someone inside the building risked their life to take the shooter down. This 'reign of terror' can last minutes; 55 minutes in the case of the Naval Yard shooter, or as long as three hours, in the case of the Pulse Nightclub shooting in Orlando. How can we shorten that 'reign of terror' and give building occupants a way to maintain control of their building as well as protecting In-House Responders and First Responders?

SOLUTION

The Crotega Threat Suppression System is an active solution to Deter, Disrupt, and Delay™ a threat situation within a building. The Crotega Threat Suppression System is an Active Threat Mitigation System (ATMS) providing an additional layer of security and protection. The Crotega Threat

Suppression System creates an invisible defensive safeguard deployed by In-House Responders upon visual recognition of threat.

Activation & Effects

The Crotega Threat Suppression System is activated by a trained building administrator, trained employee or authority as defined in the emergency management plan. Crotega Threat Suppression System units are arranged in zones, concealed in the ceiling throughout “high-risk” areas in the building, such as main entrances, hallways, and large meeting areas, or throughout the building as determined by the building owner. When trained personnel identifies a potential threat, via security cameras or the “naked eye”, they actively deploy the Crotega Threat Suppression System units in the area or zone of the threat. The Crotega Threat Suppression System unit is deployed via a touchscreen control panel. An organic, non-toxic water-based solution called Repuls is then sprayed from the Crotega Threat Suppression System onto the zone of the threat. The duration of spray is programmable, lasting 5, 10, or 15 seconds, up to a maximum of 30 seconds. This solution irritates the eyes, causing involuntary eye closure, has a pungent, overwhelming smell, irritates the throat and lungs, and stings the skin, inhibiting the ability of the perpetrator to focus on targets until In-House Responders or First Responders resolve the situation. Immediately following the deployment, In-House Responders and other building occupants can move through the zone of deployment with minimal irritation.

OBJECTIVE

The goal of this document is to provide building owners and manufacturer reps a guide to introduce the Crotega Threat Suppression System to Authorities Having Jurisdiction (AHJ), such as building officials, law enforcement officials, and fire marshals. Crotega representatives have met face-to-face with Minnesota State Fire Marshal officials, Minnesota Building Code officials, and the President of the International Code Council, as well as two other ICC representatives to determine what code

issues might arise as building owners across the United States install Crotega Threat Suppression Systems for protection in their buildings.

Crotega's Investigative Process

Minnesota State Fire Marshal

Minnesota State Fire Marshals have had a significant impact on the design of the Crotega Threat Suppression System. Following a 2014 meeting with seven State Fire Marshal officials, the founder, Jody Allen Crowe, used the advice provided to advance the design of the system into its current configuration. A meeting at the Crotega Research Center with over a dozen Deputy State Fire Marshals in June 2016 led to further advice, including seeking professional consultation on the process. Two codes were cited by the State Fire Marshal's officials for further review, IFC 316.3 Pitfalls, and IFC 316.5 Security Device. Crotega has kept the Minnesota State Fire Marshals apprised of progress, including the Product Safety Lab testing of the Crotega Repuls product.

Minnesota Building Code Officials

Crotega officials met with the Minnesota Building Code officials to ask if there were any building codes that would preclude installation of the Crotega Threat Suppression System. The officials were aware of our system and had already determined there was no Minnesota building code that would stop a building owner from installing the Crotega Threat Suppression System in a building. The only time the Minnesota State Building Code officials would be involved in a decision for installation in a school would be when the \$100,000 threshold for state approval is reached. Their suggestion, when a local building official raises code concerns, is to have the building owner ask the local official to show them the code, which, according to the state officials, does not exist.

International Code Council Evaluation Services (ICC-ES)

In August 2016, three Crotega representatives, along with consultant Jay Peters, traveled to Los Angeles to meet with the International Code Council (ICC) President and two department heads, asking for an analysis of our system in regard to current International Codes. We were informed in that meeting there is no code in the International Building Codes concerning a system such as Crotega Threat Suppression System. We asked for an ICC-ES Evaluation Service Report that would provide guidance. After taking that question under consideration, we received the following response from Michael Temesvary, P.E., ICC Evaluation Service, LLC:

"I discussed the Crotega system with ICC-ES engineering management staff. They concluded that with respect to IFC recognition, there was not a particular section that would clearly apply to this type of system and act as the basis for an ICC-ES Evaluation Service Report (ESR). The attached 2015 IFC code and commentary section 316.5 was cited as being a concern for the acceptance of this particular product."

It is important to note that ICC ES staff did not consider IFC 315.3 Pitfalls as applying to Crotega Threat Suppression Systems. ICC staff provided Crotega with a copy of IFC Code 316.5 and Comments that provides a summary of the reasoning for the code. The comment section is important to understanding the intent of the code.

Crotega's Analysis of IFC Code 316.5 and Commentary

The IFC code in question, as determined by ICC ES, is 316.5 Security Device. This code reads:

316.5 Security Device. Any security device or system that emits any medium that could obscure a means of egress in any building, structure or premise shall be prohibited.

IFC Code Comment Section

Security devices that, when activated, emit a medium such as smoke or other aerosols into a building could obscure exits or confuse occupants, thus creating an inherently dangerous situation for the public and responding emergency personnel. In cases of activation of these devices, armed criminal perpetrators could be trapped inside the buildings. Law enforcement personnel arriving on the scene could easily believe that a building is on fire and

responding fire fighters could enter and be confronted by the perpetrator. Another danger is that false fire alarms could be transmitted automatically or by passers-by because of the appearance of smoke in the building. See also the commentary to Section 1031.2 regarding the reliability of exits.

Analysis:

Obscure (verb); keep from being seen; conceal. "gray clouds obscure the sun"

Synonyms hide, conceal, cover, veil, shroud, screen, mask, cloak, cast a shadow over, shadow, block (out), obliterate, eclipse, darken

Crotega Repuls is not a fog, nor is it an aerosol. It is not pepper spray, OC or CS gas. It is not deployed automatically. The system only deploys when activated by a trained person upon visual recognition of a threat inside the building. The system disperses water with irritating properties through pressurized nozzles in short bursts of 5, 10, or 15 seconds, up to a total of 30 seconds of deployment. Each burst is activated by a trained building occupant, based on visual recognition of a threat in the building. At no time is an exit pathway visually obscured, as would be if a fog were deployed or if a person set off a fire extinguisher in a room or hallway. Egress may be delayed for up to 30 seconds, much shorter of a time that would occur if a fire sprinkler head is open and spraying putrid, bacteria-laden water for as long as there is pressure in the system (a process that lasts much longer than 30 seconds and could cause a great deal of confusion and water damage). With the Crotega Threat Suppression System, egress is not obscured during or upon completion of the short burst or bursts of spray. A burst of Crotega Repuls does not "hide, conceal, cover, veil, shroud, screen, mask, cloak, cast a shadow over, shadow, block (out), obliterate, eclipse, or darken" an egress.

We understand in conversations with consultants that a precedent for delaying egress for 30 seconds has been established. IFC 1010.1.9.7 states egress can be delayed for a maximum of 30 seconds in approved settings (see addendum). When a Minnesota Deputy State Fire Marshal observed our beta site, he was clear in asking that we keep the burst to 30 seconds or less.

The total time of spray is 30 seconds or less. A person can move through the zone of deployment as soon as the spray burst ends with minimal residual impact from the sprayed water, unlike the lingering strong impact of aerosol pepper spray, OC or CS gas, which can last for days if not totally cleaned off walls, ceilings, and floors.

Federal Emergency Management Agency (FEMA) informs building occupants to Run, Hide, Fight. Building occupants are trained to go into lockdown during an active shooter or violent event. In lockdowns, building occupants are not permitted to exit or even access hallways, especially in the area of threat. Most likely, in a scenario of a Crotega Threat Suppression System deployment during an active shooting or violent event, egress from the building will be denied by the authorities until permission is granted for controlled egress. At that time, any lingering effect of the deployment will not impede egress and authorities will most likely not allow any access to the area of threat for purposes of emergency response and protecting evidence.

In further analyzing the commentary for IFC 316.5, it appears the focus of the code is to prohibit the use of security smoke machines in structures, a security strategy popular in Europe and one that is now becoming a reality in pharmacies in the United States. It was common when smoke machines were first used, that bystanders would call the fire department because they thought the smoke was from a fire and the local department had to respond, which was costly and time consuming. Smoke security devices are also considered to be one of the more dangerous things in an emergency situation because of its persistent ability to delay/prevent egress. We entirely agree with IFC 316.5 when considering fog. We have found that to be true through testing of a fog device in our research facility. We found that, with fog, while it may be an effective shielding strategy in the case of an active shooting event, visual recognition and egress would be obscured for up to 30 minutes or more.

Crotega's Analysis of IFC Code 316.3 and Commentary

ICC ES staff, in the response to our request, did not cite IFC 316.3 Pitfalls as a possible barrier. Since IFC 316.3 Pitfalls was brought up as a possible barrier in March 2016 email from a Minnesota Deputy State Fire Marshal, this analysis provides Crotega's analysis regarding 316.3.

316.3 Pitfalls. The intentional design or alteration of buildings to disable, injure, maim or kill intruders is prohibited. A person shall not install and use firearms, sharp or pointed objects, razor wire, explosives, flammable or combustible liquid containers or dispensers containing highly toxic, toxic, irritant, or other hazardous materials in a manner that could passively or actively disable, injure, maim or kill a fire fighter who forcibly enters a building for the purpose of controlling or extinguishing a fire, rescuing trapped occupants or rendering other emergency assistance.

IFC Code Comments Section:

This paragraph prohibits the use of 'booby-traps' in building, for whatever reason, if they could injure or disable the emergency responder during the performance of his or her duties.

Analysis:

Crotega agrees with ICC ES that the activation of the Crotega Threat Suppression System does not fit the definition of a "Pitfall", as defined in IFC 316.3. It is not a 'booby-trap'. It is not an automatic deployment. The system cannot be deployed without human interaction. Deployment only occurs when activated by a building occupant upon visual recognition of a threat.

The code and comments explicitly focus on forcible entry into a building by fire fighters for purposes of controlling or extinguishing a fire, rescuing trapped occupants or rendering other emergency assistance. In each of these cases, the Crotega Threat Suppression System would not activate upon

forcible entry or in the event of a fire, but only be activated by trained personnel inside the building upon visual recognition of a threat, thus not fitting the definition or intent of the code.

Business Implications

After successful integrating and testing, Crotega is confident in the design and application of the product. Like with fire sprinkler systems, we hope this system never deploys, however active shooter events, like fires, are unpredictable. The additional occupant safety and security the Crotega Threat Suppression System provides cannot be measured in lives alone. This system, paired with other security products, provides building managers and owners “peace of mind” knowing they can safely control the situation.

SUMMARY

The Crotega Threat Suppression System meets the requirements of IFC 316.3 and IFC 316.5. It has been designed such that it does not pose significant impediment to ingress or egress of first responders and building occupants. Our testing confirms that the system meets our objectives of deterring, disrupting and delaying intruders with minimal impact on occupants.

As one fire chief told me while observing our beta system in action, “We, as fire chiefs, are always analyzing risk versus reward. I see very little to no risk to my fire fighters, but a much greater reward for children, parents, and school folks.”

About Crotega™

At Crotega, the mission is to provide intuitive technology so the in-house responders can defend the defenseless.

The founder, president and author of this White Paper, Jody Allen Crowe, is an educator who worked in high risk schools and dealt with weapons in schools. He authored The Fatal Link, a book on school shooters.

The Sandy Hook tragedy led him to start Crotega, LLC, to research and develop a way for those inside of buildings to maintain control of the building during an active shooter or violent event to minimize or stop casualties.

Addendum

1010.1.9.7 Delayed Egress.

Delayed egress locking systems shall be permitted to be installed on doors serving any occupancy except Group A, E and H in buildings that are equipped throughout with an *automatic sprinkler system* in accordance with [Section 903.3.1.1](#) or an *approved automatic smoke or heat detection system* installed in accordance with [Section 907](#). The locking system shall be installed and operated in accordance with all of the following:

1. The delay electronics of the delayed egress locking system shall deactivate upon actuation of the *automatic sprinkler system* or *automatic fire detection system*, allowing immediate, free egress.
2. The delay electronics of the delayed egress locking system shall deactivate upon loss of power controlling the lock or lock mechanism, allowing immediate free egress.
3. The delayed egress locking system shall have the capability of being deactivated at the *fire command center* and other *approved* locations.
4. An attempt to egress shall initiate an irreversible process that shall allow such egress in not more than 15 seconds when a physical effort to exit is applied to the egress side door hardware for not more than 3 seconds. Initiation of the irreversible process shall activate an audible signal in the vicinity of the door. Once the delay electronics have been deactivated, rearming the delay electronics shall be by manual means only.

Exception: Where approved, a delay of not more than 30 seconds is permitted on a delayed egress door.

5. The egress path from any point shall not pass through more than one delayed egress locking system.

Exception: In Group I-2 or I-3 occupancies, the egress path from any point in the building shall pass through not more than two delayed egress locking systems provided the combined delay does not exceed 30 seconds.

6. A sign shall be provided on the door and shall be located above and within 12 inches (305 mm) of the door exit hardware:

6.1. For doors that swing in the direction of egress, the sign shall read: PUSH UNTIL ALARM SOUNDS. DOOR CAN BE OPENED IN 15 [30] SECONDS.

6.2. For doors that swing in the opposite direction of egress, the sign shall read: PULL UNTIL ALARM SOUNDS. DOOR CAN BE OPENED IN 15 [30] SECONDS.

6.3. The sign shall comply with the visual character requirements in ICC A117.1.

Exception: Where approved, in Group I occupancies, the installation of a sign is not required where care recipients who because of clinical needs require restraint or containment as part of the function of the treatment area.

7. Emergency lighting shall be provided on the egress side of the door.

8. The delayed egress locking system units shall be listed in accordance with UL 294.