

Fire Engineering

CHANGING OUR CENTER of GRAVITY IN STRATEGIES and TACTICS/PART 1

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The American fire service by now should be rethinking its center of gravity when it comes to strategies and tactics. It should be well understood that no application of any given tactic should be undertaken without a strategy. All too common in the American firefighter is the aggressive strategy in approaching structural fires with the offensive mode of attack in mind. It seems as though our decision making process many times defaults to the aggressive interior fire attack overlooking other elements that exist during our advance on structural fires. With a little strategic patience upon our arrival we can provide for better decision making strategies which will result in a more improved and safer tactical plan of operation. It is simply not just defensive or offence that is applicable at structural fires; there are now as we know many other considerations that have to be weighed in this fast paced dynamic environment. Our strategies define our commitment to risk on the fire ground for both civilian and firefighter alike. There exist both interior risks and exterior risks at any given structure fire. First in companies need to identify these risks early on depending on factors of what is seen and possibly heard. Collapse potentials and basement fires are just a few that come to mind. Firefighters and their commanders should be aware that it just doesn't simply come down to deciding strategically if we are going in or staying out but rather that our strategies and decision making process relates to risk and what we think and do at structural fires.

A good sense of strategy is our approach to any structure fire is where in time and progression of the fire we see has or has not and to what extent affected the structure which in turn shifts our strategies from possibly an initial offensive/aggressive campaign to a high risk defensive campaign. The volume of fire, its rate of growth and the duration of the incident indicate along with a difficult advance on the fire should indicate to us that the possibility of structural collapse in portions of the structure may be inevitable. We can no longer accurately predict fire behavior in the modern day built environment as a result of multiple factors such as lightweight materials, fuel based fire loads which produce high heat release rates which result in more unpredictable high risk events. It is all too easy and all too common during this modern day built environment to experience flashovers, smoke explosions, partial collapses both interior and exterior along with limited visibility and constant changing conditions. Buildings are falling

apart too easily and many times without a warning sign prior to going in as well as developments occurring while we are in. Many times large volumes of fire may not be visible and what we think is manageable becomes unmanageable and out of control even when we think we have made the right choices regarding our aggressive actions. There are four areas of understanding and gaining knowledge of the following during hands-on firefighting.

- **Building Construction**
- **A Full View Size-Up**
- **Interior Visibility**
- **Location of Fire**

Without these considerations and observations firefighters cannot understand what may be going on around their tactical area let alone the overall action plan chosen by those also not seeing the big picture. All of this accumulates into bottom line poor life saving decisions along with our aggressive offensive procedures coming to a halt as a result of a change of events that could have been avoided. Many times Incident Commanders donate to the problem by simply relying on visible fire from their exterior positions without contemplating the involvement of lightweight construction and rapid heat release rates from fuel laden fire loads within the interior. Everything escalates to firefighter injury and death because of misconstrued fire location and prolonged zero visibility when it comes to those on the inside. It has little to do with what we see on the outside when we first arrive when what is presented to us during our size-up makes us believe that the fire is manageable for the aggressive interior firefight decision. When things change on the inside from what was first thought to be manageable and now reveal deteriorating conditions interior companies need to inform those in command on the outside because the overall picture to them maybe something quite different. It is this 2 sided coin where what we see and what we get from both outside and inside deserves constant size-up and communications from both interior and exterior positions.

Many in the fire service today think that we are becoming too restricted regarding the abundance of safety restrictions and overly cautious behaviors that we are losing sight of are true purpose in being more aggressive versus pulling back in getting the job done. Putting it bluntly is that we are expected to put our lives on the line within our decision process at fast paced dynamic events always subconsciously demanding of us that the offensive interior firefight is also what is expected. If firefighters, officers and some chiefs throughout the American fire service had their way and this includes the majority of us we would always prefer the adrenaline tactic of going interior. The reality of this driven approach should be that we will always be willing to take on the interior firefight but we should start our driven approach with a defensive posture of thinking as soon as we receive the alarm. There are four strategies or

postures that encompass all of our tactics at fires that are incorporated or past through during the initial dispatch through extinguishment and life rescues. These four postures are listed below in the order that they should be brought to our attention before the aggressive move of the interior attack. These postures can also undulate between themselves throughout any given incident and their reevaluation should be continuous during structural firefighting.

- 1. Defensive Posture and Mindset.**
- 2. Transitional Dynamic Posture.**
- 3. Cautious Aggressive Posture.**
- 4. Aggressive Offensive Attack.**

The Defensive Posture and Mindset

The truth of the matter regarding a defensive posture and mindset is that it begins within the receiving of the alarm and is maintained while fluidly assessing the other postures while arriving at the scene all the way up to the decision to going interior. We start our defensive approach when we climb onto the apparatus, apply our seatbelts and drive with restraint in getting their alive and without injury. We know all too well the fire service tragedies involving injury and death from collisions and ejections while trying to get to the scene both to firefighters and civilians. In the volunteer service areas this includes those responding from home in personal vehicles whether to the fire house or directly to the scene. The statistics speak for themselves. If we apply immediate aggressive behaviors going out the door the writing on the wall becomes apparent that at one time or another someone either civilian or firefighter will be injured or killed. Officers should never encourage high speeds and should control those that drive with a lead foot thinking that putting the pedal to the metal will make all the difference in the world in our efforts to save lives and extinguish the fire: It Won't!

Another defensive thought process or mindset is that upon receiving the alarm and driving to a confirmed working fire is that officers and firefighters should have two thoughts going through their minds and that is flashover and collapse. Due to modern lightweight construction and residential contents of hydrocarbon petroleum based products these two features are highly probable in their occurrence at structural fires. Once firefighters arrive and begin proper size-up these factors along with zero visibility should be recognized. Because the adrenaline fed visual fire dynamic we see before us drives us we immediately become focused on speed while feeling that precious time is slipping away for us in our ability to quench the beast forgetting that part of the time equation is the time and duration of the fire's existence prior to us getting there.

Should we be thinking more on the big picture and its relevancy to our tactics, tactics they may require collapse zones and defensive postures instead of the aggressive interior firefight. Are we just tunnel visioned into getting in instead of remembering we also need to get out? Upon arrival a conscious effort should be made by all firefighters especially officers and chief officers to base decision making on a risk benefit analysis. In simple terms we will risk a lot to save a lot. If we decide to move away from a defensive posture into a more aggressive action it should be based on a high probability of success in both savable property and savable lives. There is no need to gamble when things look bad they are bad and it's time for nothing but defensive actions whether they entail hitting everything from the outside or setting up zones for potential collapse or both. If the situation begins to deteriorate to even worse conditions defensive actions may have to be expanded even further. Many firefighters have been severely injured and killed even when they think that they have established collapse zones only for them to find out after a wall collapses that they came up short.

When we enact a defensive posture the risk factors for injury and death should diminish. On the other hand even within a defensive posture there are still risks to firefighters possibly from handling large hose lines, power equipment, working in tower ladders not to mention severe and extreme weather conditions. There are situations where the defensive posture moves to an offensive posture because conditions may have improved or we think that there is still some reward to gain from this whether it is for lives or property but we should be sure that going back to aggressive actions has been weighed heavily. Remember if when we arrived we felt little reward would warrant high risk actions we would have done so early on rather than now well into an incident when there is even less to gain.

The Transitional Dynamic Posture

Having now understood the early footings in establishing a defensive posture from the time of the alarm to our arrival we now enter the dynamics of transition upon what we initially see and do at a structural fire. Firefighters and officers should realize that this posture still should not allow us to be tunneled into aggressive behaviors such as the decision to enter the structure head long without determining key elements that need to be determined for the interior firefight. The transitional dynamic posture involves a solid size-up or 360 of the structure. The information that we gather at this point is most critical in determining our letting loose for aggressive actions. If we do not read the fire and the structure correctly there will be little we can do about it once we decide to enter exposing us to a host of deadly possibilities. There are also great decisions made correctly to move to the aggressive campaign of interior firefighting and rescues and still things end up going bad, so let's make sure the odds are as correct as we can get them in our favor. So how do we ensure our actions in saving lives and property when dealing with this period of a transitional dynamic posture?

To this day we still have firefighters and their officers that forgo the critical step of proper size-up meaning a sound 360 around the structure. By performing a proper size-up we are giving ourselves the edge in living and dying as well as for our civilian counterparts who we are trying to save. There are also many firefighters and their officers that perform a size-up but they fall short in the recognition department of the hazards being shown to them from the structure. Many times things may not register due to lack of experience and reference from previous fires. The simple phrase of High Risk Low Frequency events for some departments and their members is many times the cause of misinterpreted size-ups. Another occurring factor when misinterpreting size-ups is the actions that result in a defensive nature when we could have performed in an offensive strategy instead. The fire ground as we know is in an ever constant mode of change and therefore we should always be examining our dynamic transitional posture. The following factors influence our dynamic transitional posture which requires firefighters to take actions that may direct us into an offensive strategy or a defensive strategy.

- **Visible volume of fire needing extinguishment from the outside in order to move in on the inside.**
- **Occupants needing rescue who can be visibly seen or in a confirmed location.**
- **Changes or revealing circumstances in structural integrity.**
- **Ventilation needs. Attainable and coordinated.**
- **Manpower on the scene.**

The above circumstances require actions influencing our dynamic transitional state occur frequently on the outside of the fire structure and also carry with it extreme risks in not necessarily deaths but serious injuries to firefighters racing against time and this is inevitable. This is why training is so very important to a fire department and its members in performing within all of these actions.

As we know that any presenting viable occupants who are visible in need of rescue especially from windows will take precedence over other actions that are needed at structural fires. There are also times where multiple actions may have to occur when savable occupants can be rescued such as hose line protection during civilian rescues. Many viable rescues can occur with positive results when known occupants are at windows within reach of our ladders especially when the interior stairs or an interior removal is not possible. When visible and credible information on the location of those in need of rescue are presented their survival is totally dependent on our actions done with relative speed. When these elements present themselves the application of ventilation and where it will be performed carries with it increasing dangers to survivable occupants in drawing fire and smoke conditions to them. Any use of positive

pressure ventilation techniques should be avoided at all cost because the probabilities of fire and smoke conditions can be forced into areas that may diminished the survivability profile of occupants. Wind directions and speed can also diminished occupant survivability and require fire companies to move with even greater urgencies because of our inability to control wind driven conditions.

Part of our transitional dynamic posture is an aggressive attack that incorporates exterior water application as quickly as possible instead of running head long into the interior for extinguishment. When a particular volume of fire presents itself in a free burning state through to the exterior of a structure heavy consideration should be given to knocking it down while cooling the rate of heat release from the exterior and then provide for an interior campaign. As we can see by this tactic that an aggressive fast application of water will bend the odds in our favor before going interior reducing the risk of flashover and high heat conditions. In all probability it will slow the fire as well as inhibiting it from further extension to exposures within the structure. First in companies should place this tactic high on the priority list when these conditions present themselves when revealed through a proper size-up. Also incorporated into this action is realizing and identifying where truly is the fire at and where it is going. Firefighters should be very aware that even with this approach in sizing up a fires position and behavior that the fire dynamic is forever changing especially after we leave the outside to go inside. Still the positive aspects to this transitional approach will be well worth the effort by keeping the fire and its behavior more towards the room of origin. It will also help considerably in providing occupants a longer window into their survivability and rescue. When performing an exterior stream application for the purpose of slowing and cooling the fire before going interior we should use an indirect attack method when possible instead of directing the stream right into the seat of the fire. Hitting the ceiling first makes sense whether the fires is on the first floor and even more so with fires on floors above. Reducing temperatures and limiting thermal inversions is more of the prominent feature of this application then what was thought to be in the past that we were pushing fire throughout the structure and onto occupants needing rescue. The effectiveness of this tactic should be totally realized in the fire service and should be incorporated routinely when possible for it guarantees the fastest attack possible with the quickest application of water onto the fire reducing risk to civilians and firefighters alike. It also many times eliminates the need in consuming our air supply leaving us that supply for when we move in offensively.

Another important part of our aggressive campaign is identifying structural integrity at structural fires. It is obvious that this should be part of our size-up but still firefighters have walked into harm's way resulting in collapse many times for what looked sound in stability ended up being attacked and compromised by unrecognizable conditions that could not be seen. This is especially relevant more so at larger structures such as commercial or industrial

buildings as a result of deep seated fires many times masking structural integrity. Lightweight construction as we know when exposed to fire will be affected and affected quickly within short exposures to fire and high heat. The size of structures are usually clear from the outside but the engineered design of a structure is often hidden which elevates the level of risk that firefighters may encounter when deciding to aggressively go interior. It is important to note that the size of a structure especially larger ones whether commercial or residential many times has to be approached with a strategy of an interior advance to get to the seat of a fire but we should make sure that the extent and location of a fire is known. We should always keep in mind that the shortest distance to get to the seat of the fire should be chosen which can provide a more accessible escape for our members if things should change. The location of a fire and its size affects structural integrity as well as knowing the ventilation profile when arriving and during the firefight. Before a committed aggressive interior advance we should know the relative position of fire within the structure to avoid going into areas that result in fires above or below us that were unrecognized resulting in what we know all too well produces fatal outcomes.

The importance in understanding a transitional dynamic posture is that it is part of offensive strategies and tactics. Transitional dynamic postures help very quickly our decision process in coordinating our fire attack and our ventilation needs and position. Aggressive fire attack and ventilation go hand in hand and the importance to our survival and interior occupants needing rescue is critical. Once firefighters open the front door for an interior approach a ventilation flow path has immediately begun and can have grave consequences along with other ventilation points preexisting or induced. Many departments throughout the American fire service continue to use positive pressure ventilation techniques before and during fire attack some of it creating positive results while other forms of it creates disastrous results. There is no question that sound ventilation techniques and its timing and position create interior environments that improve overall conditions reducing risk to firefighters and civilians alike. The problem many times during the aggressive fire attack is that a single ventilation point usually the front door is all that is created while we quickly advance onto a fire. If this type of limited ventilation is all that is being done then the fires ability in producing untenable conditions and prolong zero visibility takes its inevitable toll in either chasing us out of the structure or causing severe exposure leading to firefighter fatalities from flashover states. This along with ventilation points whether single or multiple being affected by wind inevitably will affect our abilities in getting to the fire and extinguishing the fire. Wind as we know can cause fires to gain in size as well as spread rapidly throughout a structure over taking our abilities in putting the fire out as well as causing fatalities for both civilian and firefighters alike.