

# Posts inside a network → new tactics ?

The reforming of the Belgian fire service aims towards a network made up of stations. A network that has to achieve cooperation in order to guarantee a better firefighting service. A better service towards civilians, but also a safer mode of operating. A network of stations implies that firefighting means will be dispatched in different ways than before. Firefighters stationed in different stations will need to work together. Such cooperation will require common tactics. Obviously it's unwise for two stations to arrive on a fire scene and start their intervention independently from one another. An advantage of this network is that it allows for more means to be put into place during fire calls, as opposed to having just a single fire service respond to the call. A perfect example of this is a second engine for firefighting. At present, the second engine is only sent into areas where the fire service with territorial authority will not be first to arrive on scene. Most fire services send just a single engine anyways when they're both fastest on scene and have territorial authority. It is common sense however that for every fire two engines are sent on scene. Regardless of the fire's location, citizens are entitled to the same service. More means offer the distinct advantage of being able to tackle several different subtasks faster or even simultaneously.

## 1. Cooperation requires both anticipation and reaction

For some time now there has been a rule in effect called 'fastest adequate help'. The rule had some severe implications because on one hand the term 'fastest' was easily determined. On the other hand however, the discussion has been going on and on about the definition of the adequateness of means. A lot of people share the opinion that fighting residential fires requires two fire engines. Not just in the area where a certain station happens to be faster than the territorially authorized one, but in every case of a residential fire.

Since the introduction of fastest adequate help, most fire services now have areas where two engines will arrive on scene. As a result the difficulty now lies in coordinating different fire crew actions as swiftly and effectively as possible. There are numerous tales of interventions not running as smoothly as they should. Therefore the following concepts, imported from foreign colleagues, are offered to help efficiently deploy the necessary means.

## 2. Size-Up or 360° reconnaissance

### 2.1 Detached and semi detached housing

For detached and semi detached housing it's advisable to quickly circle the building. It's possible that the front of the building offers a completely different view as opposed to the back. By quickly circling the building, crucial information about the fire can be gathered. Based on this information, proper course of action can be taken by the fire crew. Another possibility is for the Lieutenant (Lt.) of the engine to initiate the primary attack, while the incident commander (IC) performs a 360° reconnaissance. A thermal imaging camera

(TIC) can help to provide the info that might otherwise escape the naked eye. The engine Lt. will try to get a view of the situation inside while the IC checks whether that information is consistent with what's showing on the outside.

This thorough recon will provide a more accurate assessment of the ventilation profile of the building. Are there any windows left open? Is there any cracked glass that's about to collapse entirely? Such information will tell us a lot about the development in fire behavior that can be expected.

## 2.2 Row housing



**Fig 2.1** At these kind of fires, the view from the back can differ completely from that of the front.

When dealing with row housing, it's often impossible to perform a full reconnaissance. Observing the front of the building is often the only thing that can be done in a small period of time. Usually the best option is to commence the interior attack while the IC or another officer tries to get a look at the back through a neighboring home.

When dealing with larger buildings or objects, the aerial can serve as a vantage point. When looking out from the aerial it is possible to see things that would remain invisible when viewing from street level. It is therefore imperative that the firefighters on top of the ladder communicate sufficiently with the IC. Even here a TIC can lead to an enhanced assessment of the situation.

## 3. The CAN report

As soon as an engine arrives at a house fire, one person assumes command of the scene. If that person's a Lt., he will probably lead in the interior fire attack. The moment the IC arrives to take over command or as soon as the second engine arrives, the need arises to determine further course of action. It's therefore crucial that the IC or the Lt. of the second engine communicates with the first Lt. who by now has already gathered a lot of info. This can be done by use of the CAN report.

CAN is an abbreviation which stands for Conditions, Actions & Needs. When making this statement, the Lt. of the first engine is able to pass on a substantial amount of information. Officers in charge can match this info to what they're able to perceive on the outside of the building and base further actions on the combined and complete picture.

### 3.1 Conditions

In the first part of the report the engine Lt. relays what's happening inside. "*What are the conditions ?*" The Lt. can make use of the B-SAHF model to continually assess the situation inside. Based on this assessment he will try to briefly describe the fire progress. Some important aspects which are crucial to mention are the fire's ventilation profile and

the phase of development the fire is currently in. Based on this info the chief officer on the outside can ascertain the risks of the fire. Likewise it is possible to use this info to determine the means that need to be deployed further, as well as decide upon ventilation possibilities (see previous articles). If necessary, the fire location can be passed on as well.

Example:

*"We're facing a ventilated fire in growth stage on the second floor, at the back of the building."*

### 3.2 Actions

In the second part of the report, the first engine Lt. passes on what he is currently doing inside. *"What is the primary crew doing right now?"* Depending on the delay between arrivals of the first and second engine, the primary crew will already have undertaken certain actions. The Lt. will maybe relay that his crew is currently extinguishing the fire. In that case he will also pass on the means he using for this task. Another scenario is that the crew is executing a bail out rescue at the back of the house with a portable ladder. Maybe the fire crew has only just arrived and is still searching for the seat of the fire? It's very important for the chief officer outside to know what the inside crew is doing. Only then can the crew of the second engine be deployed efficiently.

Example:

*"We're extinguishing the fire with one 45." (45mm hose line)*

### 3.3 Needs

In the third and final part of the report, the Lt. of the initial engine communicates the needs he is experiencing or expecting. *"What actions can be done by the second engine crew?"* The crew of the second engine can be deployed to support the crew of the first engine. This support could be the forming of a backup team. Another possibility is the deployment of a second attack line. Maybe a vent outlet needs to be created immediately to allow for safer advancement by the primary attack crew. Yet another option is for the second crew to deploy a positive pressure fan.

It's possible that the attack crew Lt. feels he has the situation well in hand. In that case he can make recommendations. Maybe during his advancement into the building, he has noticed signs of people living in the building. He could then ask for a complete sweep of the building for any possible victims.

Example:

*"Get us a backup team"*

### 3.4 In summary

*"We've found a ventilated fire in growth stage on the second floor at the back of the building. We're fighting the fire with a single 45. Get us a backup team."*

Using these brief statements, the Lt. inside can relay a lot of crucial information to the chief officer outside within a time frame of 30 seconds. In view of an optimal cooperation between stations, it would be a wise course of action for chief officers arriving on fire scenes to ask for a CAN report of the Lt. already there. The first Lt. doesn't even have to be inside a building. Even when performing exterior firefighting operations it's often useful to share information. When the Lt. is inside the house, it's vital for the IC to check whether the info of the CAN report corresponds with what's showing on the outside. Should the IC perform a 360° recon to find flames exiting the home on the first floor, after having received the above report, then apparently the fire has progressed substantially between the arrivals of the two engines. It's then up to the IC to decide whether it's still safe for the interior fire crew to continue. In the example above that would probably not be the case and it would be wise to order the withdrawal of the interior attack crew. Afterwards the IC can deploy the two attack crews simultaneously on the first floor or, if even that's too dangerous, change to a defensive exterior attack plan.

## **4. Extinguishing**

### **4.1 Primary attack line**

When during the reconnaissance the fire's location has been established, a primary attack line can be deployed. For this the Lt. has a choice between a high pressure booster line or a low pressure line of 45mm. Deploying this attack line can take some time. Especially when the crew has to advance under a smoke layer, it will take some time for them to reach the actual seat of the fire. Continuous cooling of smoke gases is vital. The attack crew needs to take enough time to observe the effects. By using a TIC, the Lt. can assess whether the interior attack is successful. If necessary the decision can be made to abort the primary attack.

### **4.2 Backup team**

As soon as the second engine arrives on scene, additional personnel and means are made available for further actions. After coordinating with the Lt. of the first crew, the choice can be made to deploy a backup line to protect the primary attack team. When using the new deployment system with low pressure hoses in cassettes and coils ("the Cleveland hoselay"), the first engine will normally provide its own backup team. This backup team will normally position itself about 4 meters away from the primary attack crew and will also perform gas cooling. Their job is to safeguard the attack crew by securing an escape route. Should the fire progress too quickly, they can utilize their nozzle to cover the retreating attack crew. Because of this it's preferable for the backup team to use a low pressure line of 45 mm. A number of fire departments use different colors for hose lines. The fire service of Knokke-Heist has long since used yellow for their attack lines and blue for their backups. An organized color scheme makes it easier for Lt.'s arriving later on scene, to determine further necessary actions.



**Fig 4.1** For a (chief) officer arriving later on scene, it's clear there are two crews inside the house: a yellow line for the attack crew and a blue line for the backup team. (Photo: Jean-Claude Vantorre)

It's important for the backup team to be deployed dynamically. When after the advance of the attack team a large fire is found, the backup can forego their protective function and assist in fighting the fire. A quick knock down of the fire will always be the best protection firefighters can offer to anyone still inside the building: firefighters as well as civilians. As soon as the fire is put out, conditions will improve inside. The temperature will stabilize and even start to drop. The same goes for the concentration of smoke inside the room. A good example of a backup crew becoming a second attack crew, is a fire in an underground parking lot. Here the backup crew will follow the attack crew in. Should the attack crew eventually discover three burning vehicles, then naturally the backup team will close in to tackle the fire as well. If not, it would take too long for a single hose line to extinguish all three vehicles.

#### 4.3 Second attack line

There are situations as well where the attack crew doesn't need a backup team. A fully developed fire on the second floor is a good example of this. Such situations require a large flow rate to subdue the fire. In order to achieve this, the deployment of a second attack line can be asked. The second crew will then attack the fire directly, as will the first crew. Seeing as the first crew will already be putting water onto the fire at that time, a high flow rate will be needed. Therefore it will often be a good idea to use a low pressure line of 45mm.

Because of the progress made in the field of residential construction, fully developed fires are becoming ever more rare. A lot of the time firefighters face a fire in the growth stage. When an attack crew is forced to advance through or under a smoke layer, it's advisable to provide a backup team before deploying a second attack line.

#### 4.4 Exterior attack

In general firefighter knowledge of fire progress is growing. This is a very positive development which aids in achieving a higher level of firefighting. More and more firefighters are able to use an interior attack strategy to put out the fire. Every (chief) officer needs to realize though that there are situations where an interior fire attack is not best course of action. Sometimes it's better to opt for a defensive strategy and deploy an exterior attack. Protecting neighboring buildings will then be the first concern. Aside from this, a (partial) collapse of the burning building at some point in time needs to be taken into consideration.



**Fig 4.2** Exterior attack at a fully developed fire. Stability of the building is compromised and the building itself is beyond saving.

It's very important that the decision for a defensive strategy is well communicated. A very dangerous situation arises when the second engine crew decides on a defensive exterior attack plan while the first engine crew has opted for an offensive interior attack. Coordination is key.

### 5. Search & Rescue

One of the many tasks of firefighters is rescuing victims. Upon arrival of the first engine the means are insufficient to support both fire attack and search and rescue. In the past the default choice was to focus on search and rescue. Before the introduction of breathing apparatuses this was the logical choice. Today when facing fires in growth stage and under ventilated fires, this choice is less obvious. It may well happen that the fire progresses during the search inside the building. A lot of research has been done by NIOSH in the US into so called Line Of Duty Deaths (LODD's). These are fatal accidents suffered by firefighters. Many examples of the past decade show one or more firefighters being caught unaware by the fire's progress during a search and then perishing as a result. Because of this the strategy of "First, put the fire out" is gaining widespread support. Probably this strategy will become the standard mode of operation in the future.

#### 5.1 Primary search

Employing a two engine system makes it possible to perform firefighting and search and rescue operations simultaneously. Fire crews regularly save lives while doing this. The spread of smoke does form a massive problem however. Therefore it's important for the search to be executed in a systematic way. Every room needs to be thoroughly checked. In the US this is called "primary search". A well trained fire crew will be able to sweep all rooms quickly. When during this a victim is found, the search is aborted in order to evacuate the victim for medical care while awaiting the arrival of an emergency medical crew (EMC). Such a crew consists of a doctor, an emergency nurse and a paramedic. After this the search can be continued. It may well happen that another crew will

continue the search. A good communication by (chief) officers is crucial to avoid rooms being skipped.

## 5.2 Secondary search

Some time ago at a large structure fire in an inhabited building, the IC ordered a systematic check of the building. About five unconscious victims were escorted out along with several conscious, yet intoxicated victims. Three EMC's arrived on scene to attempt to revive the victims. Besides the medical crews, the crews of dispatched ambulances and firefighters on scene who had additional training as a paramedic tried to help the victims. The IC was told by two Lt.'s that the building had been fully checked. During his own inspection of the building an additional victim was located and extracted for medical care.

Nobody's perfect and people make mistakes. Procedures can possibly offer the solution for this problem. Especially when people are being saved and a search is being aborted to get them out, there's a chance that one or more rooms might not have been searched properly. This is also the case when multiple search crews are being used. Finally it may well happen that a resident will try to find an exit himself and loses consciousness in a room that's already been checked.

For a house fire, fighting the fire and primary search are the two top priorities. It will depend on the available means how swiftly both tasks can be performed. In the US, firefighters will perform a "secondary search". By systematically checking every compartment twice, the problem as described above is avoided. As soon as firefighters are available, for instance when the fire has been subdued, a secondary search can be initiated. Ideally this is done by a different crew than that which performed the primary search.

## 6. Ventilation

Another possible scenario is that the fire attack crew is having difficulty advancing because of the heat and smoke. In a number of situations it will be possible to create an opening high up. A smoke hatch at the top of a stair case or a window on the top floor come to mind. When the choice for ventilation has been made, a crew will create a vent opening at the top of the building. Afterwards a positive pressure fan can be placed at the bottom.

## 7. Combination

The use of two fire engines for structure fires creates a difficulty which needs to be overcome by the fire service. We have to work together as well as possible. In past times the above tasks could only be performed sequentially, where as today it's possible for several teams to cooperate to achieve better results. The IC (if necessary supported by his Lt.'s) will have to make a choice. Following the size up, a primary attack line will be deployed. After this, priorities will have to be weighed. It's also very important for an organized deployment to agree on a firefighting term for each option. Only then will IC's be able to make clear to different crews what's expected of them. The primary attack line can be combined with a backup line, a second attack line, a search and rescue,

ventilation, ... A smooth and seamless cooperation between different fire crews will allow for more efficiency and safety.

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