

Grenfell, what now?

1 Introduction

The Belgian army has numerous armories spread all over the country. These armories are located on military grounds. Such grounds are separated from public lands by fences with barbed wire. The bunkers in which the weapons are stored, are locked and soldiers patrol the area regularly. This is all done so that for example, terrorists cannot get in to these facilities to arm themselves.

Now suppose the Belgian government decides that the fencing needs to be taken down. Military grounds are often situated in beautiful nature settings and so this will allow civilians to make hikes through the woodlands. Suppose the army decides it needs to cut back on costs and it is no longer going to patrol the area with soldiers. Suppose the person responsible for the armory decides to leave the bunker unlocked. After all, then it will take a bit less time to open to door and get in for routine tasks. Now suppose that a terrorist group manages to break in to the armory and gets the weapons. Then the group heads into downtown Brussels to attack a civilian crowd.

The Brussels police department will need some time to respond to such an incident. Suppose that 72 people die in such an attack. Suppose that afterwards, an investigative commission is formed and that the press concludes on the basis of their research that "the Brussels police department has made fatal flaws" and that "the police could have saved more lives during the attack".

Suppose that the research would primarily focus on the actions of the police and that the questions of why and how the armory was able to be raided, are relegated to a "second phase" of the research. All while at the same time neatly highlighting what the police did wrong. Now, we would have a nice analogy of the Grenfell research.

The fire service did not start the fire.

The fire service did not build or renovate that building.

The firefighters did everything they could to save as many lives as possible.

That being said, **in hindsight** it is possible to search for possible points of improvement for the fire service. As firefighters it is our duty to learn from this incident. The fact that the situation turned out to be what it eventually was due to decisions and choices of other people (not in the fire service), does not matter. Most of our incidents are a result of something going wrong in normal society, and people are counting on us to fix it. We can not hide behind the fact that others screwed up. Grenfell happened. Those buildings exist (also in Belgium). What do we learn from this?

2 Lessons

The Grenfell Tower Inquiry has set up a very large scale investigation. There are literally hundreds of hours of hearings online, as well as hundreds of pages in written reports. The press has also been extensively covering the incident. Therefore, I certainly did not process all of the available information. In the following sections, I outline what I think, are the



most important lessons to be learned from Grenfell. The selection was made after reading excerpts from the reports and after talking to colleagues such as Christian Gryspeert (B), Ricardo Weewer (NL), John McDonough (AU), Paul Grimwood (UK) and Michael Reick (D).

2.1 Stay put vs. evacuate

The London fire service used the *Stay put principle* in firefighting operations inside high rise buildings. This means that all of the occupants are safe in their apartments, with the exception of the people inside the fire apartment.

On the Grenfell incident at a certain point in time, this assumption turned out to be no longer correct. However, it took quite some time before a commanding officer reached that conclusion. This was done at 2:47 AM by Assistant commissioner (AC) Andrew Roe. The dispatch of the fire service though, had changed their advice from "Stay put" to "Evacuate the building" 12 minutes earlier. However this was not communicated to the fire crews on the scene.

The fire service had been on scene for 1 hour and 48 minutes before it was decided that *Stay put* was not (or no longer) a viable strategy. On one side of the building, the fire had spread into the top end of the tower at 1:27 AM. Not until a full hour later, did command conclude that the safety of the other occupants was no longer guaranteed.

AC Andrew Roe belongs to the fourth level of officers, comparable to a colonel in Belgium. None of the lower ranked officers had reached the same conclusion. This tells us that a scenario in which the entire building had to be evacuated, was not being considered. At the same time, the emergency call center had already been getting an enormous amount of *Fire Survival Guidance* calls (*FSG Calls*). These are calls by occupants who are trapped in the building by the fire and who are in danger. In hindsight, the number of FSG calls in combination with the different locations inside the building from where these calls were coming, were a clear indicator that the building should have been evacuated much earlier.

Up to 17 times, fire crews were sent in to rescue occupants from flats based on FSG calls. The fire service started way too late with deploying crews based on that info. On top of that, during the Grenfell fire a lot of the fire crews did not achieve their originally assigned tasks because they ran into additional victims needing help on the way up. Only 3 of the

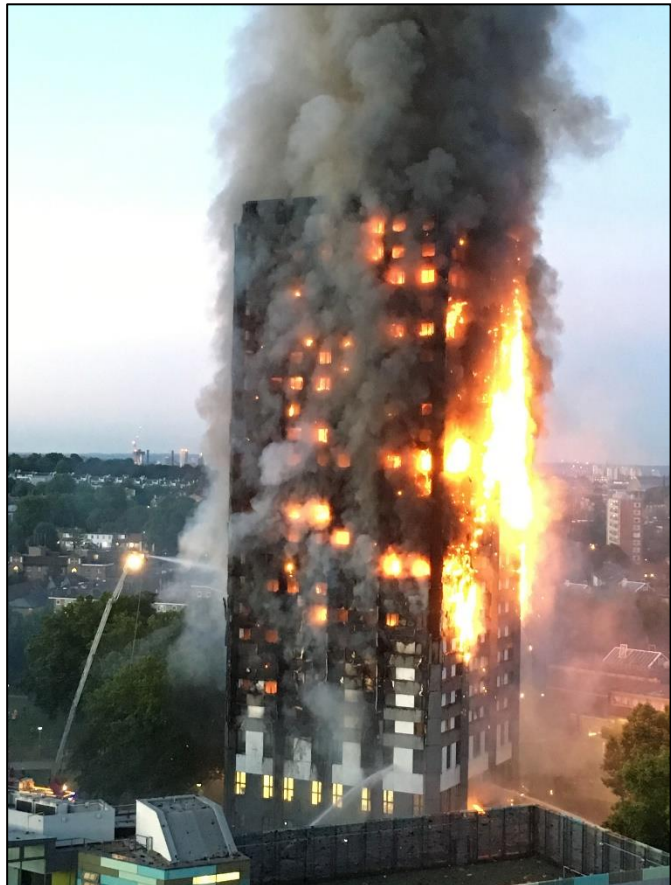


Figure 1 The fire started in an apartment on the 4th floor and subsequently created a cladding fire. Afterwards, the fire moved from outside back to inside.

17 crews were able to get out all the occupants of the apartment to which they had been initially sent. Two other crews could save some of the people in "their" assigned apartment and 12 crews aborted their mission because they ran into occupants from other apartments. These 12 crews managed to rescue a large number of victims, but for the commanding officers it was unclear that they hadn't completed their initial tasks. After all, the crews were coming out of the building with victims. And often these firefighters were completely exhausted and in need of medical care themselves. Because of that, there was no debriefing of the crew and no other team was sent to the initial designated apartment where victims were still waiting for help. The phase 1 report contains several examples and illustrates one case in which a family of five is told by the dispatch at 01:29 AM that they should stay put and that help is on the way. Eventually at 03:09 AM they are told that they should try to get out of the building on their own, a task which has become impossible at that time. These people waited over two hours for the fire service before they lost their lives.

Despite the Stay put advice, people still started to evacuate the building. This did not prove to be easy going. The building had only one single staircase which quickly became filled with smoke. On the lower floors, crews were battling the fire. Apartment doors were open to allow hose lines through onto the fire level. This caused large amounts of smoke to flow into the staircase.

When it eventually was decided to completely evacuate the building, the fire service had no means with which it could convey this message to the occupants. Such systems are often used in office buildings, hotels, hospitals, ... but not in residential apartment buildings.

In summary we have the following lessons learned:

- The fire service took way too long to switch their strategy from *Stay put*, to complete evacuation of the building.
- There was only one staircase which had to be used for both fire attack and for rescue/evacuation.
- The actions of the firefighters caused this staircase to become filled with smoke which in turn rendered it unusable.
- The fire service had no means to simultaneously warn/call out to all of the occupants that they had to evacuate.
- The communication on the evacuation, the rescue operations and the FSG calls was difficult. During such a large scale operation, a group of people has to be assigned to this task immediately. They should be led by a separate senior officer. On top of that, they have to have their own radio frequency/channel available to them.
- There also has to be some sort of system to keep track of which crew has been sent to what apartment and also, what was the result of their search & rescue.



2.2 Flammable cladding

Flammable cladding on high rise buildings is an innovation that the construction industry has come up with over the past years. In a world that keeps pushing energy efficiency, it makes sense to add insulation on the outside of a building. For large scale renovations, it seems like a logical step to take. However, the fire characteristics of the materials that were used, were not taken into account. This puts the fire service for yet another difficult task.

Most fire departments in the world are not yet ready to tackle such a fire. London is no exception here. The Brussels fire service got lucky in 2015 when the insulation inside the wall of a new high rise building started smoldering [8].

The fire service of Ypres also faced a violent fire in a somewhat larger mid rise building with flammable cladding.

Luckily, the building only had 6 stories. This meant that ladder trucks could be used effectively to battle the flames. Because of the limited height, this fire was much easier to tackle than the Grenfell fire.

The fire in Ypres did not have any casualties, but it does show that a Grenfell type of fire could just as well occur in Belgium.



Figure 2 The cladding fire in Ypres. In some locations, the façade is “open” and flames are showing. In other locations, the façade is still “closed” and plenty of smoke is being produced. (Picture: Warre Saint-Germain)

2.3 The building is our workspace

We need to have knowledge of the *built environment*. Firefighters need to know how a building functions. We need to understand the influence of our actions on the building. A high rise building relies on compartmentalization. Fire doors are installed to limit the spread of smoke. That means it is important that the doors remain closed. However, we as firefighters will have to open doors to get to the fire. These doors will remain partially open for our hose lines. The Grenfell research stated multiple times that this facilitated the spread of smoke.

The same thing applies in our Belgian buildings. Belgian legislation does not allow for water risers with landing valves on each floor to be installed in the staircase. Usually these are found in the hallway on each floor. This means that firefighters have to open the hallway door one level below the fire, in order to connect attack hose lines to the riser. Next, they have to go up and open the door to the fire level in order to launch the attack. The fire service facilitates smoke spread by doing this. In the article *The standpipe* from March 2018, a call was already made to change these regulations [7].

As buildings become more and more airtight, smoke spread inside the building is increased. Because of airtight construction (specifically the outer walls), pressure buildup inside the building is much higher. This causes the smoke to spread further on the inside. This in turn means that the assumption that people are safe within their flats, is becoming less and less true. The construction industry has been focusing more on building airtight (towards the outside) over the last years. The problems that came from this, became incrementally bigger. Because of the relative slow evolution, the fire service did not realize they had a big new problem on their hands.

2.4 Preparation

In the UK, there is a document called *Generic Risk Assessment (GRA) 3.2*. This document has to enable the fire service to perform its own risk analysis on the territory that it has to protect. The GRA document states that the fire service has to produce plans for individual buildings. These plans have to take into account the fire extending past compartment boundaries, the possibility of multiple rescues and the need for a total evacuation plan in case "stay put" is no longer viable.

With the knowledge we have today **and looking back**, it is clear that the London fire service was not prepared for this. But this is probably true for most of the fire departments worldwide. The demands of GRA 3.2 can only be met if there is enough personnel available to draw up those plans. In Brussels, there are over 1000 high rise buildings, including countless apartment buildings. There are no individual firefighting plans available for any of these apartment buildings. The question is also whether individual plans are a desirable outcome. Producing specific plans for each and every high rise apartment building would be an incredible waste of resources. Instead the fire service has need of a good general guide line for firefighting in high rise buildings.

The fire service should also have a backup plan for special incidents. It is unacceptable that company officers and young chief officers are left to their own device when an incident occurs, the kind of which happens only once every decade. Each fire department should think about how they can get additional aid on scene (from neighboring departments or even from the rest of the country). This also means enough senior officers to lead the operation. There is not a single fire department in Belgium that is capable of dealing with such an incident and which at the same time can provide continuous coverage of the rest of their operational area. As firefighters, we are skilled in cooperation. Therefore, we have to reach agreements on how we are going to help and support one another when an exceptional incident such as this occurs.

The phase 1 report was very harsh on the London Fire Brigade for not having an operational evacuation plan for Grenfell. The fact that legislation dictates that the fire service has to have these plans at the ready, is why they were judged so harshly. The fire service has to be careful with any "promises" they might put in procedures and guidelines. When the legislative branch demands outcomes that are wholly unrealistic and unachievable, the fire service needs to communicate back on this clearly and vigorously. It is up to the fire service to make it clear when demands are being made which cannot be met or when government and politics need to invest more in extra resources.

In the *London Safety Plan* which was drafted up by the London fire service, the LFB writes that they are aware that many occupants of high rise buildings are worried about their



safety. They assure people that the fire service has plans of these high rise buildings containing vital information. This vital information is electronically available to crews heading out towards the scene so that they can quickly start up the operation.

In reality there were hardly any plans of the London high rise buildings. The fire crews arriving on scene, did not even know how many stories the building consisted of. Again, this is an example of a "promise" made by the fire service which in hindsight, could not be met. The phase 1 report is very hard on this.

The London Fire Brigade has a pre-determined attendance for all types of incidents. These are all of the resources that are sent out on any specific call. The standard response for a fire is 3 engines and for high rise fires an additional engine with a 13,5 meter ladder is sent out. However, a senior officer is not dispatched to such a fire! A true ladder truck was not sent out either! The entire operation had to be led by a Captain (US) or Adjutant (BE). In Belgium and the Netherlands, it is obligated by law that a senior or chief officer is sent out to each and every structure fire. This probably goes for all of the countries with modern fire services. It is questionable at the least, that this was not the case in London ...

Another issue that the report rightfully points out, is the fact that the LFB is unable to get enough senior officers on scene within an acceptable time frame. Of course it is difficult to compare the English hierarchic structure to the one in Belgium. An additional fact is that the Anglo-Saxon fire services (UK, US, Australia, ...) does not recruit senior officers directly. Everyone had to start at the bottom of the ladder. Another detail to note is that in English, the terms "senior officers" (UK) and "chief officers" (US) are used when referring to officers in Belgium. The term "officers" is used to what we in Belgium call "petty officers" (company officers).

This article uses the following comparison:

UK	Belgium	US
Crew Manager (CM)	Sergeant	Lieutenant
Watch manager (WM)	Adjutant	Captain
Station Manager (SM)	Lieutenant	Battalion Chief
Group Manager (GM)	Captain	Division chief
Deputy Assistant Commissioner (DAC)	Major	Deputy Assistant Chief
Assistant Commissioner (AC)	Colonel	Assistant Chief
Commissioner	Department commander	Fire Chief

At the Grenfell scene, Watch Manager Michael Dowden arrived with the first crews at 00h59. He remained in incident commander until he was relieved by Station Manager Walton at 01h50. That is almost one hour later! By then there were already two other SM's on scene. SM Walton first did a 10 minute size up of the situation upon his arrival at 01h40. By then it was already clear that the incident was far too big to be handled by WM Dowden. Dowden had already scaled up the operation to a total of 25 engines.



London is a true metropolitan city with a population of 8.9 million people. This means London is 7 times bigger than Brussels. In Brussels, a minimum of three senior officers are on watch 24/7 in the fire station. At a confirmed high rise fire, a second senior officer is dispatched towards the scene. In Belgium there is a law called "minimum resources" which rightly states that a senior officer has to be sent on scene at each building fire. The law does not define the time frame in which this has to be done. That is up to the fire department to decide. How many fire departments really keep track of their response times? In London, the response time was unacceptably high.

2.5 Command & control

One of the issues that pops up repeatedly is the transfer of command. The adjutant/captain (WM Dowden) that arrived on scene first, was Incident Commander (IC) for nearly an hour. He was then relieved by SM Walton. This senior officer was only in command for 8 minutes. He was relieved of command by DAC O'Loughlin. DAC O'Loughlin was the IC for the next 48 minutes. Around 02h44, AC Roe took over command. This means that there were four different IC's and, as a result of this, three transfers of command. The report states numerous times that these transfers of command did not go well. Too little information was shared. The strategy that was currently being executed, was not discussed and as a result, the new IC never properly questioned that strategy.

A viable criticism that the fire service can have on the report is the following: it is by no means clear how long a briefing will take during a transfer of command. A fire is a dynamic event by definition. Conditions might change rapidly. During the Grenfell fire, they did so. If the fire service were to take several minutes to discuss and analyze the situation, then the situation will have changed already. There is a risk of getting overtaken by the events.

Both the report and the questioning sessions of the investigation, assume at all time that there is an unlimited capacity when it comes to processing information. At several instances, investigators point at the information that was at hand at a given time. However, we must not forget the fact that transfer of information takes time. Passing on information through radio communication takes time. There may well have been a lot of information available, that does not mean that the IC could have absorbed and processed it all.

Richard Gasaway talks about several human factors that illustrate our limitations in this area. He compares the human brain to a computer. A computer does not have infinite capacity. The processing capacity and memory storage are both limited. The same is true for the human brain. **The report assumes that officers are at all times capable of absorbing and processing any and all available information, so that they can then make a decision.** Experience has taught us long ago that it does not work this way. Commanding officers on the fire ground do not analyze all of the available information. Gary Klein defined the theory on *Recognition primed decision making (RPDM)*. Commanding officers are subconsciously searching their memory for similar situations so that they can make a decision based on a similar incident in the past. This is one possible explanation why things went wrong in Grenfell. Such an incident had never happened before. Therefore, all of the IC's could not fall back onto previous experience. Suddenly, RPDM does not work anymore. Major Bruggemans, chief officer of the fire service of Antwerp, contributed to a paper on the subject matter [13].



To truly analyze information, as the Phase 1 report repeatedly states, takes time. A lot of time. It is unclear whether the (senior) officers on scene were physically capable of absorbing and processing all of the information. The assumption made in the report could prove to be false. *This is something that is worth investigating in phase 2: how long does it take for an officer to absorb and process that much information ... ?*

2.6 Training for company and chief officers

Chapter 27 of the Phase 1 report deals with the training of (senior) officers. None of the officers and senior officers on scene, had been given training on the impact of flammable wall cladding on fire operations. They did not understand what was happening on the fire ground. Several among them testified that "a building was not supposed to behave in such a way". The first IC described that he felt "helpless".

The report states that there is an unwillingness amongst the fire service to accept the fact that these types of fires were bound to happen. The fire service was, in other words, negligent. The report speaks very harshly on this matter. It says that *"the failure to train firefighters in how best to fight cladding fires was the inevitable consequence of the LFB's institutional failure to inform its firefighters about the risks they present"*.

Fortunately, the report explicitly states that the first four teams on scene (incl. the first IC) were untrained to fight the fire they were facing. In other words: the organization of the London fire service is at fault here, not the individual firefighters.

It is up to senior officers to determine the vision of the organization. They have to make sure that the fire service is ready to handle changes in our society, especially when those changes hold serious consequences for the fire service. Next, the fire service needs to communicate that vision to all of its people. A support base has to be formed both in and outside the fire service. There's a need for new procedures, training, material, ... This all takes time.

All of this is clearly pointing towards a structural error that is also present in the Belgian and Dutch fire services. Senior officers are so tied up in management tasks, fire prevention, logistics, ... that there is hardly any time left for anything else. They spend little actual time on the craft of firefighting. Often, that is not a personal decision made by those people. More often than not frustrations arise because they become aware of their own shortcomings. But the situation does cause senior officers to have little focus on new developments in human society, never mind that they should be forming vision addendums based on these changes. This leads to situations on the fire ground where they find themselves lacking in training.

3 Possible solutions

Grenfell is a very dramatic incident which never should have been allowed to happen. Such buildings should not be allowed to exist. But... they do exist. Grenfell has made it painfully clear what kind of risks these buildings hold and it is up to the fire service to try to come up with solutions to this problem.



3.1 Smoke spread

One of the bigger problems of the Grenfell fire was the smoke spread. Smoke spread is often a problem at fires in high rise buildings. Paul Grimwood's quote is clear: "We have to protect the staircase at all costs". *How can we limit the spreading of smoke in such a building?*



Figure 3 During the Ypres fire, lots of smoke was produced. This picture shows the cladding still mainly intact. Because of this reason, little oxygen can reach the burning insulation. This in turn leads to an increased smoke production. The smoke is being pushed from the façade at the connection with the roof. During such a fire it is very likely that there will also be (lots of) smoke spread in the building itself. (Picture: Warre Saint-Germain)

Michael Reick suggests setting up a smoke stopper on each door which has to be opened. This action will limit the inflow of smoke into the staircase. Next he recommends venting the staircase by using a fan in combination with the smoke hatch at the top of the staircase. This tactic should improve inside air conditions enough so that civilians can use the staircase for evacuation.

In practice, the fire service has need of several things in order to achieve this:

- Sufficient number of smoke stoppers
- Sufficient number of firefighters
- Sufficient training

Looking back at Grenfell, it is advisable for fire services that have a lot of high rise buildings in their area, to fit a vehicle with 20-some odd smoke stoppers. That way, there will be enough smoke stoppers available when a large need arises at a high rise fire.

Paul Grimwood introduced staircase protection teams in Kent. These are teams consisting of firefighters whose job it is to keep the staircase free of smoke and to help people evacuate. At a large high rise fire, there will need to be an engine per staircase. This means

a large amount of resources will be deployed. It is not custom to ask for massive additional resources once on scene. However it is crucial that this is done quickly and early during the incident. In the early stages of the incident, it is still possible to influence the situation in a positive way and still keep the possibility of total evacuation.

The firefighters assigned with this task, have to receive proper training. Such training does not have to be expensive and doesn't have to take long. Training of the senior officers will be more difficult. They will have to assess when to switch from a standard fire operation to one that requires a lot more resources on scene.

3.2 Learning from past incidents

The fire service has a poor record of learning from past incidents. Worldwide, there have been around 100 fires of that kind already before Grenfell occurred. Almost everyone has seen them on TV or the internet. Who of us has gone abroad to study this topic? Why is it that nobody said "*We have to learn from this*" ?

We don't even have to travel far. Even close to home, there are opportunities to learn. In London, a few years before Grenfell, there was *the Lanakal house fire* where the stay put strategy did not work. The *Phase 1 Report* was very critical on the fact that the LFB did not act on lessons learned from that fire.

Closer to home, there is the Ypres fire. *How many fire services sent out people to learn from that incident?*

3.3 Evacuating a high rise building

The *Phase 1 Report Overview* clearly states that the fire service needs to develop procedural guidelines regarding (partial) evacuation of high rise buildings. Then again, the report shamelessly and unfairly uses **hindsight knowledge** for this. It is rather easy in hindsight to claim that firefighters on scene, who were overwhelmed by the amount of information, should have done things differently. Actually, the report assumes that it is even possible to train people to such a level so that they can **receive and process** such a large amount of information. It is uncertain whether that is even possible. In the post Grenfell era, the fire service needs to seriously think about this and come up with ways on how we can evacuate a high rise apartment building.

Apartment buildings in Belgium are long since being built in such a way that each unit is a separate fire compartment. In practice this means that our society accepts there will be casualties in the apartment where there's a fire, but not in the other units.

Because of this, it used to be possible to keep the occupants of the other apartments in their homes. This principle was/is usually being applied. The name *stay put* is not commonly used in Belgium, but the method of operating is the same: the fire service attacks the fire in the burning apartment, tries to save lives in that specific apartment while at the same time the other occupants of the building stay where they are. At night, it was often the case that most of the occupants did not even notice that there was a severe fire somewhere in the building.



But also in our part of the world, a change is happening: it is common knowledge that smoke production is much higher now than say 50 years ago. The many objects consisting of synthetic materials that are found in homes nowadays, produce significantly more smoke than their older counterparts made of natural materials.

Next, the walls of compartments have become less airtight than before. A lot of new technology requiring cables has been invented: electric and data wiring. In a lot of existing buildings, these wires have been retrofitted. This means the wiring was installed afterwards. To do this, holes are often drilled through walls. These holes are often a lot larger than the combined wiring. Sometimes, entire shafts are being cut into walls so that a larger number of wires can pass through. When there is a fire, the smoke will use these holes and shafts to spread through the building.

Unlike in the past, the fire service now faces high rise building fires, in which the assumption that people are safe in their units, is no longer true. Suddenly the possibility that (parts of) the building has to be evacuated, becomes very real.

At the time of writing this article, a federal task force is working on a new procedure called *fires in high rise buildings*. In the draft of the procedure there are a number of criteria which state when the fire service should switch from *stay put* to *total evacuation of the building*:

1. When the fire has spread (vertically) over more than two floors.
2. When the fire has spread (horizontally) over more than two apartments.
3. When the fire breaks through the façade in an office building with landscape architecture.
4. When the fire has not been controlled by the fire service within 60 minutes upon arriving on the scene.
5. When the fire service anticipates that one of these criteria is about to be fulfilled in the near future.

High rise buildings in Belgium have to have two staircases as dictated by law. The idea behind this is that one staircase can be used for evacuation, while the other one can be used for fire suppression. In Grenfell, there was only one single staircase. In that case, evacuation will happen more slowly. After all, there will be two way traffic (at least in some areas): occupants are going down, while firefighters are trying to go up. In Belgium there are also high rise building with a single staircase, so this is not a problem that is specific to London. Here, we would also have officers asking themselves:

- How do we execute such an evacuation?
- How do we communicate to the occupants that they have to evacuate?
- How long will such an evacuation take? In other words, can we get everyone out in time?

So Belgium too, will now have certain things in procedural writing (the so called "promises") for which:



1. Firefighters are not trained.
2. The fire service won't know how to properly perform such an evacuation.
3. The fire service won't know how long such an evacuation takes.
4. The fire service won't know how much personnel they need for such an evacuation.
5. There will be no training since there is a lack of knowledge on this topic.

The following needs to happen:

- 1) The federal center of training and expertise (KCCE) should organize a series of tests in which a high rise building with a realistic occupancy, is being evacuated by the fire service. This has to be done in a scientific manner so we can research how best to achieve the evacuation, how long it is going to take and how many firefighters we need to achieve this.
- 2) Next, a training course can be formed for firefighters (senior officers included) to execute and to manage the evacuation and to decide when to switch from *stay put* to evacuation.

The fire service should also think about what to do with all the evacuated people. During a large part of the year, these people cannot stay outside on the street during firefighting operations. Weather conditions often do not allow that people stay outside in their pajamas. On top of that, it is likely that during an evacuation, people will incur minor injuries or that there will be elderly people in need of medical assistance. This too will need to be taken into consideration.

Fire Survival Guidance (FSG) calls are another thing that is not known in the Belgian first responder setting. Such a system would be easy to put in place with the emergency call centers. For the emergency call centers, there are lessons to be learned as well. As long as we are dealing with only a small number of FSG's, a principle of *informed search* can be maintained: each caller gets assigned one team that comes to rescue him or her. As soon as the number of FSG's runs too high, we need to switch to a systematical search operation wherein all apartments are checked one by one. It goes without saying that we need a large number of people for this operation.

3.4 Training for senior and petty officers

The national reform of the Belgian fire service and its training programs in 2015, has led to a large step forward that was urgently needed. Belgium was at the back of the pack in many regards compared to other countries. The training of firefighters and petty/company officers increased four to five fold. Theoretical courses were combined with sufficient and decent practical courses. The lieutenant (US: battalion chief) training (OFF1) however, was shortened. The time has come to seriously update this course. Grenfell clearly shows the need for that. On top of that, the rapidly changing and evolving world in which the fire service operates, demands more training and education for all of the officers already active in their rank. In the paragraphs below, several possible topics are listed which could prove to be beneficial.



After Grenfell it has become clear that firefighters (including senior officers) do not sufficiently understand the impact of flammable wall cladding on the fire's progress. Therefore, it is highly recommended that this is incorporated into the (company) officer training. There is a clear lack of attention for command & control within the training curriculum. Incident command system (ICS) is almost absent in the Belgian Fire service. On the positive side, a federal task force has done some work on this already. Delivering a CAN report and even giving extensive briefings at large incidents should be part of the training curriculum.

Concept such as *Recognition Primed Decision Making* and *Situational Awareness* should be known by each and every (petty/company) officer. People need to understand how their minds function at a fire scene and what the limitations and pitfalls are.

Assumptions are very important to a senior officer's work. Often the officers perform tasks while under time pressure. This means they cannot do a complete analysis of the situation. The solution to that problem is using assumptions with prerequisites. As long as the assumptions are right and the prerequisites are being met, then our jobs usually go well. Luckily, most of the time this is the case, however there are some exceptions. An important part of the senior officer's job is verifying those assumptions so that they adjust during the exceptional situations. This topic too needs more focus in the senior officer's training curriculum.

For the IC of a large scale incident, it is probably impossible to absorb all of the information out there. All the officers in command functions should constantly be asking themselves: *Do I have information that the IC needs for his size-up?* That way, they can actively communicate information to the IC instead of waiting passively until they are asked a question (while at the same time, they are also doing a bunch of other stuff). The IC on the other hand, does not have to actively question everyone (only to receive a ton of information that is not critical). He will be busy handling many different tasks simultaneously and will be getting important information sent to him "passively". Next, he can use that information for decision making.

The Phase 1 report indicates that the officers on scene were being overwhelmed. Considering the scale of the incident, this is not that strange. However, at some point it does create a situation where they are no longer capable to calmly reason and think upon the situation. All of their attention is focused on reacting to various events. They are constantly chasing the situation while being several steps behind. What they really need is someone to do the situational reasoning for them. Just as on hazmat incidents, there is a specialized hazmat advisor on scene to support the IC with critical information, so should there be an advisor on large scale fire scenes to

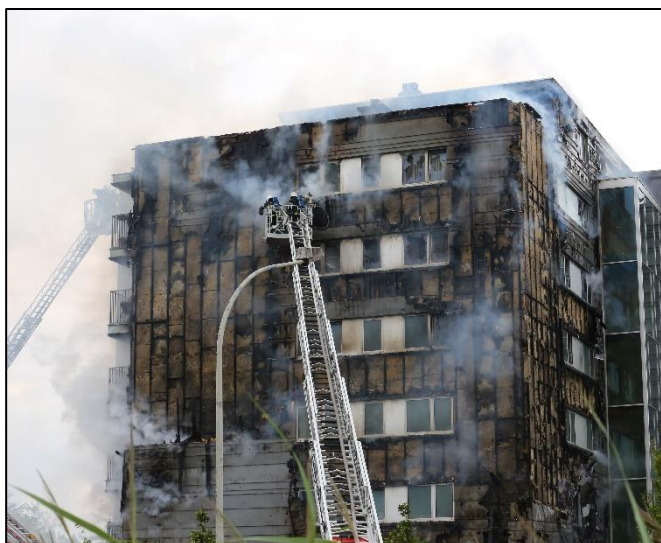


Figure 4 At the end of the fire in Ypres, little fuel is left on the façade. (Picture: Warre Saint-Germain)

keep focus on the fire behavior and advise accordingly. The hazmat advisors have built up a very nice track record over the past 10 years. *Maybe it is time for a similar project on large scale fires ...*

4 Closing remarks

Grenfell was tragic. That fire showed that the fire service cannot cover everything on an operational level. The patron and/or building contractor and/or architect have provide the basic fire safety level of the building. That prerequisite was certainly not met in the case of Grenfell. Phase 2 of the investigation will hopefully provide more insight into this. Only then will there be some light shed onto the true cause of this tragedy. Hopefully then – probably 5 years after the facts – judgement will be equally harsh on these people as it was on the fire service.

For now, it is up to the firefighter community to improve things and advocate change where needed. If the international fire service comes out of this stronger and better prepared for these kinds of fires, then at least 72 people did not die for nothing.

We also have to communicate clearly on what we, as firefighters, can and cannot do. Politicians have to clearly understand what they can expect of the fire service and what they cannot.

Finally, my heartfelt praise goes out to all those who were at the Grenfell scene. We need to also realize that the firefighters did an amazing job. Despite the many problems and issues, dozens of firefighters risked their own lives to save people. Often this was done in situations that most firefighters will probably never face in their entire careers. And despite all the improvements that can be made in the fire service, the firefighters that were there on that night deserve our eternal respect. That must not be forgotten...

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