NORMAL CHAOS REVISITED

Critique arising from Grenfell Inquiry Report Part 1

Background to the Report

In the early hours of 14 June 2017 a fire broke out in a domestic appliance. This caused a kitchen fire of relatively modest size that was "perfectly foreseeable" (Para 2.12.c). The London Fire Brigade (LFB) responded promptly and yet the fire escalated rapidly. In just over half an hour the domestic fire had become a major incident that stretched the LFB to breaking point. While 227 residents managed to escape the building and despite the great courage and dedication shown by the service overall, 71 did not (Para 1.3). In hindsight this event was seen as the "worst fire in Britain since Second World War"[i] and was "Like no other"[ii]. Even the Inquiry Report states that the fire created something "unprecedented" that resulted in evidence that suggests "both personnel and systems were overwhelmed by the scale of the disaster" (Para 1.20).

On 15 June 2017 the UK government set up a public inquiry under the Chairmanship of The Rt Hon Sir Martin Moore-Bick into the fire the previous day. The Terms of Reference (ToR) for the inquiry are replicated in Table 1. Although the ToR do not explicitly require the Inquiry team to extract lessons learnt from these events, this requirement is implicit in the requirement "to make recommendations". It is the lessons learnt that are the interest of this paper.

The Inquiry's Terms of Reference are:
1. To examine the circumstances surrounding the fire at Grenfell Tower on 14 June 2017, including:
(a) the immediate cause or causes of the fire and the means by which it spread to the whole of the building;
(b) the design and construction of the building and the decisions relating to its modification, refurbishment and management;
(c) the scope and adequacy of building regulations, fire regulations and other legislation, guidance and industry practice relating to the design, construction, equipping and management of high-rise residential buildings;

[i] John Sweeney, Grenfell report for Newsnight BBC2, 7 Jul 17.

[ii] Sky news, 21 Mar 18

(d) whether such regulations, legislation, guidance and industry practice were complied with in the case of Grenfell Tower and the fire safety measures adopted in relation to it;

(e) the arrangements made by the local authority or other responsible bodies for receiving and acting upon information either obtained from local residents or available from other sources (including information derived from fires in other buildings) relating to the risk of fire at Grenfell Tower, and the action taken in response to such information;

(f) the fire prevention and fire safety measures in place at Grenfell Tower on 14 June 2017;

(g) the response of the London Fire Brigade to the fire; and

(h) the response of central and local government in the days immediately following the fire;

and

2. To report its findings to the Prime Minister as soon as possible and to make recommendations.

On 30 October 2019 Moore-Bick published his Phase 1 Report[iii]. He explained that he had decided to conduct the Inquiry in two phases. He stated "Phase 1 would identify exactly how the fire started, how it escaped from the flat of origin and how fire and smoke was able to spread throughout the building in a manner and at a speed that prevented many people from escaping, despite the prompt attendance of the emergency services. Phase 1 would also examine the response of the emergency services so far as it bore on the decisions made and actions taken on the night of the fire" (Para 1.7): it is on this aspect (the response of LFB on the night) that this paper now focuses. The Inquiry was tasked to "find out what happened and why" (Para 1.8) so that we might learn from this experience and to ensure 'that it will never happen again'.

In his opening statement, when presenting the Phase 1 Report, the Chairman stated[iv] what he thought were the key issues as far as the LFB response was concerned. He listed these as being:

- Failure to train incident commanders to recognise a fire in the external wall of a high rise and how to respond to it.
- Failure to produce a contingency plan to evacuate the tower.
- Failure to revoke the stay put while the stairs remained passable.
- Lack of effective communications between control room and the incident commander resulting in a failure to share important information.
- Deficiency in command, control and communications systems.
- Failure to provide control room staff with appropriate training to manage a large number of survival guidance calls, and
- Failure to learn from the Lakanal house fire[v].

[iii] https://www.grenfelltowerinquiry.org.uk/phase-1-report; accessed 2 Dec 19.
[iv] https://youtu.be/YE9idAhfq4o accessed 24 Dec 19.
[v] This fire occurred in a resident tower block on 3 July 2009. It resulted in the death of six people and injury to over twenty others. This fire started in a television and spread rapidly trapping some residents in their homes.

The fact the LFB was seen to have failed to learn the lessons from the Lakanal house fire, while disappointing, cannot come as a surprise to anyone observing the UK inquiry process from the perspective of learning. The weakness in the current system has been raised before (for example see Lauder 2013[1] which examines inquiry reports produced not only in the UK but also in the United States, Australia, France and Norway). The main criticism of these inquiries is that they provide learning about past events rather engendering new learning from this event. The concern is that this approach is also the primary paradigm in other jurisdictions bringing with it the same barriers to learning. This issue, this barrier to learning, will be described and addressed by this paper so that other countries can assess whether this issue applies to them. In addition, Reason (2000:768[2]) calls the opportunity to learn from others' misfortune "free lessons". The worldwide community of first responders needs to take the opportunity to learn from the tragic events at the Grenfell House fire and others like it from around the world if these free lessons are not to be missed.

It is also important to put the Moore-Bick report into perspective. It would be wrong to dismiss the problems raised here as this report being particularly bad. It is not. The Report produced and the analytical process behind it were found to be typical of this type of work as identified by Lauder (2013). The problem of learning from such events is not down to the Moore-Bick team but it is the process and mental models used to formulate their judgements. If this process continues then we, as a society, are likely to continue to fail to learn from these events. The question here is why the inquiry process fails to help us learn from past events.

Aim of The Paper

The aim of this paper is to examine, from the perspective of complex dynamic systems, the recommendations made by Moore-Bick in Part 1 of his Report (published 30 Oct 19) into the Grenfell fire in order to identify weaknesses in the current inquiry system as a learning process. [This paper will repeatedly refer to the Moore-Bick Report. It will be referred to as "the Report" for ease of reference: paragraphs within the Report will be referred to by the label "Para".)

This paper will set out the research approach taken and positions this work within the concepts of Scholarship of Application (Boyer, 1990) and that of Engaged Scholarship (Van de Ven, 2007). The issue this paper addresses is how we make sense of our experiences in order to learn from them. The paper describes the use of two alternative analytical approaches; the first of these is in common use (labelled the *perfect world* paradigm) and the second has been labelled *normal chaos*. The paper uses the Grenfell Inquiry Report (part 1) as a case study. It examines the dynamics of the Inquiry, the substance of the Report, the way it *structures* it recommendations, the recommendations themselves and the Report's perception of what failed. The paper goes on to look at the implications for learning of some features of the *perfect world* paradigm, namely its reliance on rules, the clash of cultures that this created between the Inquiry team and the practitioners and how this affected keeping residents safe and decision support systems including the decision to revoke the stay put policy on that occasion. Finally, the paper provides a summary of its findings, a

The rapid spread was facilitated by the external cladding. The subsequent inquiry raised issues that remainder pertinent yet unresolved nearly 10 years later.

description of the perceived limitations of this research and its conclusions and recommendations for future research.

Research Approach

This research is located within the Scholarship of Application (Boyer, 1990). This discipline focuses on how academic knowledge is applied to practice. This is coupled with Engaged Scholarship (Van de Ven, 2007) that looks to involve the practitioners in the deliberation as to the meaning and implications of the findings. While other academic disciplines tend to be centred on one field, the Scholarship of Application is rather more eclectic in its use of other academic work. Rather than focusing on developing "academic truths", the test for this work is "are the ideas useful?" In practice, this means helping practitioners "ask better questions". (See Reed in Huff, 2000[3]).

In the approach taken to the Scholarship of Application, precedence is given to lay theory rather than being based around academic theory. In this context, lay theory can be seen as practical expectations of "how things work" based on the practitioner's knowledge and years of experience. This is placed in a juxtaposition with academic theories which are based on their own rules of validity. In both cases the theory is taken as a starting point for testing either through logic or empiricism.

In the case of this paper, the work looks to establish that this Inquiry team, led by Moore-Bick, has based their analysis on the *perfect world* paradigm. This paradigm provides, in effect, the Inquiry team's lay theory of how the world works and so their recommendations are based on restoring the *perfect world* through the recommendations they make. My analysis then looks, through logic and the academic knowledge about organisational failure triggers, to test how the team utilised their base proposition. This research makes the assumption that the team were not aware of either their base mental model or the hidden biases that come with their professional discipline as lawyers. There is clear evidence in the text provided by the Report that there was no reflexive process (in the social science use of the term[vi][3]) used by the Inquiry team.

As this paper is looking to examine what is learnt (or not learnt) through the inquiry process, it takes a position advocated by Argyris (1976[4]). In his paper Argyris advocates what he calls **Double-loop learning.** This approach to learning is proposed because he recognises that the way a problem is defined and solved can also be a dynamic that shapes the problem itself. In essence, the first of Argyris' loops uses decision-making rules, the second loop looks to modify these rules in the light of experience. In the case of this paper a key premise is that any rule in a system has to be tested for its validity and be applicable in the circumstances that it was being used.

Sense Making and Learning

[vi] **Reflexive:** Logic (of a relation) always holding between a term and itself… (of a method or theory in the social sciences) taking account of itself or of the effect of the personality or presence of the researcher on what is being investigated.

This paper is part of a programme of work being conducted … examining alternative ways of thinking about and managing complex situations. The analytical lens is provided by the *normal chaos* paradigm. Development of the framework was inspired by Perrow's Normal Accident Theory (1999[5]) and previous users of Chaos and Complexity Theories. The background to and previous discussion of this framework can be found in Lauder and Marynissen (2018[6] and 2019[7]). Lauder (2015) was an examination of disaster prevention through the lens of Disaster Incubation Theory. This work sought to use the knowledge of disaster triggers (as collated in Lauder 2011[8]) to pre-empt future disasters, crises or accidents. The conclusion drawn was that knowledge of these triggers was, in itself, not enough to enable the appropriate agents to prevent such events. The issue that defeated the necessary foresight was the complexity of everyday events. This work was consistent with Perrow's warning of Normal Accidents in complex closely coupled systems. It was consistent with proponents of High Reliability Organisations (HRO) (See Weick and Sutcliffe[9], Schulman[10], Roberts[11], LaPorte and Consolini[12] and many others) who suggest that the number of accidents might be reduced by HRO practices but they also warned that the possibility of accidents still happening remained (Le Porte, 1994:207[13]). The reason for these failures is often the complexity of closely coupled interactions setting in train a cascade that ends in failure: in other words, a normal accident. In his work Perrow is concerned with large *scale* events and their consequences. However, in everyday life the same mechanism is working at much smaller *scale*s that do not have catastrophic consequences. In everyday life we adjust to these events and move on. This is so normal we do not take the time to take note of them. To date this research has shown that it is easier to understand why these slips, lapses, errors and mistakes occur by looking at the mechanism within complexity theory.

Ways of Seeing

In order to undertake double loop learning we need to examine how the Inquiry team "defines the problem". Another way of saying this is to determine the way they see or frame the problem. This "way of seeing" can also be seen to constitute the Inquiry team's lay theory of success. The proposition that this paper intends to validate is that the Inquiry team holds to the *perfect world* paradigm. This paradigm was identified by Lauder (2013[14]) in a study of twenty accident and inquiry reports. The basic proposition of this paradigm is that if we recruit the perfect people, produce perfect plans, train them perfectly, supply them with exactly the right resources (including perfect unambiguous information) and execute the plan flawlessly (eliminating all slips and lapses) then the desired outcome will be delivered. Within this paradigm is the belief that individuals should be able to learn, retain and use the knowledge they require perfectly. All of this perfection is then supported by having perfect foresight leading to individuals being blamed and punished where they fail to achieve these standards. Embedded within this construct is the desire to remove uncertainty and to control the world around us. The label *perfect world* paradigm is used to reflect the phrase often heard when discussing failure; that is "but in a perfect world …".

This paradigm can be seen in operation across practice. It can be seen in the hope that regulations can be used to prevent some undesired outcomes. It can be seen in the expectation that best practice can be rolled out, as written in a standard, universally throughout a sector of business. It can also be seen in the way business management is taught and the way academic research tries to produce the perfect theory. Experience

however shows us that there is no panacea and management is about adaptation and adjustment to an ever-changing world. Most of all, management is about pragmatism (based on a rich seam of knowledge and experience) enabling them to cope with the uncertainty that confronts them.

From a learning perspective, the main danger of the *perfect world* paradigm is the false expectation of a controllable and therefore safer world. While this *illusion* may bring some social benefits (a discussion outside the scope of this paper) it can be counter-productive when it comes to designing highly reliable systems. The *perfect world* paradigm reduces complexity to simple linear *structures* that are easy to understand. It tries to establish direct cause and effect relationships between elements. An example of this might be to blame the last driver over the bridge for the bridge's collapse; it is very unlikely that the true cause would ever be that simple. It has a preference for command and control systems in the hope that some godlike figure can override and compensate for all the known and unknown weaknesses in the system. In summary, it sees issues within defined boundaries and as being linear in nature.

So, what is the evidence that the Inquiry team worked within the *perfect world* paradigm? Firstly, in the Report's conclusions, the phrase "should have" appears over 50 times. His term 'should' suggests a desired state rather than the actual state of the system. Second, seven recommendations are for some act to "be required by law" without any evidence that this would bring safety benefits and no examination of the correlation between poorly managed buildings and incidents of fire (in such cases a new law would not help). Third, we have the illusion of perfect knowledge as a mechanism of fire prevention. The narrative of the fire re-runs the scenario correcting perceived errors in the expectation that this will prevent the next fire; this has been dubbed the *reverse fallacy*. As each major incident is unique in character (in its specifics) such an approach is likely to fail due to its false logic of similarity (this is about *fractal* and *scale*, subjects to be addressed later). Fourth, the recommendations focus on perfecting the plans, perfecting training better, perfecting execution, perfecting communication, based on perfect knowledge and making them required by law to ensure they happen. This is *perfect world* thinking. Finally, the report's conclusions are clearly written based on the *perfect world* paradigm. The narrative centred on what "should" have happened "if" all the correct actions had been taken and how the outcome "might" have been different in this *perfect world*. In the conclusions "should" appears nearly 200 times, "if" appears over 200 times and "might" appears over 70 times. In analytical terms it would be more accurate to describe the conclusions as a "counter-narrative" rather than a narrative in that it was developed on a counter-factual narrative basis. Its premise is based on what the report author wished had happened rather than what did. It is also clear that much of this counter-factual narrative is based on hindsight despite the author's own warning not to do so.

This paper contrasts the *perfect world* paradigm. The *normal chaos* paradigm was developed during preliminary research by PM.be[vii] into the way the emergency services responded to terrorist attacks around Brussels on 22 March 2016. The study demonstrated that many of the dynamics that shaped actions of first responders were outside of the formal

[vii] Results of this research were presented to Antwerp Fire Service and other at Campus Vesta on 22 Nov 16.

arrangements put in place to manage such events. This paper will now take some time to describe what is meant by *normal chaos*. From the narrative there is evidence of the influence of *normal chaos* on the night of the Grenfell fire. From it we see the unfortunate concatenation of events (more commonly referred to as "Sod's Law"). Three examples of this are that despite the planning and resource put into developing a control room infrastructure, the facility was unavailable as it was undergoing maintenance. In the secondary facility some of the systems were not working as designed. Finally, the three Metropolitan Police Service (MPS) helicopters meant to support the management of such incidents were also out of commission as they were also undergoing maintenance. This meant that the helicopters attending the incident were not equipped with the appropriate airborne data link. [As a learning side note, it would have been interesting to know the probabilities of these coincidences occurring.]

Normal chaos offers an alternative way of seeing the world. Theory suggests that the triangulation achieved by looking at a single issue through multiple lenses, helps us to make sense of complex issues. Rather than see the world as linear, it considers it to be non-linear. Rather than seeing bounded system interactions, it sees the world as an open system. Rather than seeing forces acting on the system providing results proportionate to the *energy* input, it sees many of the forces producing disproportionate results. Rather than seeing predictability within systems, it keeps an awareness of emergent properties within a system. These are all issues taken directly from complex system thinking (See Lauder and Marynissen, 2019[15]). This world view is consistent with many strands of thinking on how we might produce reliable systems. As well as HRO and normal accident considerations, this view finds resonance with the Nobel Laureate Prigogine who talks of trying to create "islands of order in a sea of chaos"; here he sees order as a temporary situation rather than the norm. On these lines we have also noted work by Dee Hock (1999[16]) on what he calls the "Chaordic" world. In his work Hock quotes Carl Jung in saying "In all chaos there is a cosmos, in all disorder a secret order". It is this secret order that *normal chaos* thinking seeks to unearth.

Jung's view of "secret order" is consistent with chaos theory which is seen as being a predictive theory. This apparent paradox is rationalised in the way the term *normal chaos* is used. It is used to describe contexts and situations that are too complex for us, as humans, to truly understand the cause and effect relationships embedded within them. This means that where there may be order we as humans see disorder. *Normal chaos* recognizes that such complex situations produce constant uncertainty, change and unexpected occurrences that negate our plans and reduce our ability to control the events around us. This requires us to re-adjust our plans constantly as they are unlikely to be enacted exactly in the way that we had originally envisioned. Here it is the planning (not the plan) that is important. This is because plans will also be flawed and thwarted by events, and it is the planning process that keeps organisations alert to the changing environment. This approach encourages management to recognize how much time they actually spend adapting to unexpected change.

Normal chaos is seen as a way to make sense of the world. It is more focused on the literature examining organisational or system robustness (the insensitivity of system performance to external stress) and resilience. On the premise that it is not possible to produce a perfect system, the *normal chaos* approach focuses on things we cannot afford to

go wrong and an organisation's capability to cope with or adapt to the unexpected. It seeks to support and enhance organisational foresight.

Normal Chaos Catalytic Framework

To promote foresight, the *normal chaos* research programme has developed a catalytic framework; that is a framework designed to promote different (and hopefully) better questions. (For the design process see Lauder and Marynissen, 2019.[17]) The *normal chaos* framework consists of nine analytical lenses through which an issue may be examined. The lenses have been arranged in three groups. These groups have been labelled *structures*, *patterns* and *energy*.

Structures. *Structures* concern the more tangible aspects of a system and discussion of these facets gives more form to the debate. Amongst their considerations of structures, analysts should examine issues of *scale*, *interdependencies* and *self-organisation*.

> **Scale.** Within scientific work the issue of *scale* would be referred to as "level of analysis". This requires the analysts to identify the part of the whole that is being discussed. It also requires them to recognise how this factor affects the debate and the shaping of recommendations (note the link back to double-loop learning). For example, in the context of the Report, the text "London Fire Brigade" has been used to refer to the force overall, a particular group within the brigade, or an individual member of the brigade. For example, Para 2.8 talks of "The structure and organisation of the LFB"; this clearly refers to the whole Brigade. However, Para 1.19 ("the fire in Flat 16 was first reported to the LFB") and Para 2.21 ("The LFB declared a Major Incident at 02.06") refer to an individual within the LFB who took the call and the one who made the decision. In each case the act reported is just one of the many (both inside and outside LFB) implied by the statements that are needed for the desired outcome to be achieved. In turn, this provides an *illusion* that the system dynamics necessary to disseminate the information are much simpler than they actually are.
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> **Interdependencies.** Discussion of *interdependencies* looks to identify the connections needed between parts of the whole (be they individuals or groups). This seeks to establish the connections that are needed between these interdependent parts. Here the *normal chaos* analyst also looks to establish linkages between the past and the present (often critical to the context of the debate), the power relationship between protagonists, whether the relationship is productive or dysfunctional and whether there is a willingness to understand another's problem. These issues are critical in identifying the communications that are needed between these parts and their priority within the system as a whole.
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> **Self-Organisation (or Self-Organising).** *Self-Organisation* recognises that roles played by impromptu, organic or informal reorganising is out of the control of management. This often occurs either where there are gaps in the formal *structures* or where the power *structures* are not aligned to the formal *structures*.

Patterns. *Pattern* recognition is an important, if overlooked, part of the decision-making process. The *normal chaos* framework therefore requires analysts to identify and assess the *pattern*s of activity that are embedded within their systems. Amongst their considerations of *pattern*s, the analysts should examine issues of the *fitness landscape, fractals* and the role of *illusions*.

Fitness Landscape. *Fitness landscape* concerns how organisations revise their strategy in order to pursue a "best fit" (or just a "better") strategy when faced by circumstances rife with ambiguity and uncertainty. This approach accepts that "trial and error" or experimentation (complete with its potential for failure) might be the only way forward. The *normal chaos* framework therefore requires analysts to assess the robustness of the organisation's current strategy and the cost of finding a potentially better fit.

Fractals. *Fractal*s concern *pattern*s that repeat themselves. In the case of *normal chaos*, the concern is whether such *pattern*s actually repeat (whether across *scale*s or horizontally across similar organisations) to the point that they form a dependable basis for decision making within the new context.

Illusions. Anthropology clearly shows how societies use myths and legends (with their inherent falsehoods) in order to cope with life's uncertainties. Psychology also provides warning that mankind is more comfortable applying certainties that are untrue than facing the unease caused by uncertainty. The *normal chaos* framework therefore requires analysts to assess that validity of "commonly held beliefs" to avoid comforting *illusions*. For example, based on Prigogine's thinking, we need to question whether thinking that the world is ordered is an *illusion*.

Energy. The concept of *energy* concerns trying to understand the forces that shape *pattern*s and *structures*, their flow, their power to shape in the short and long term, how this energy moves within the system, and when and how the control of this energy may be lost (here the metaphor of uncontrolled *energy* loss equates explosion to crisis and has been labelled "abnormal chaos"). For the analysts, the idea of energy is based on the idea that *energy* cannot be lost or created; if it is added to one facet, it must come from another. Therefore, based on this logic, the analyst is encouraged to think about "who pays if someone else gains?" and to look more broadly to see who or what is adversely affected when a benefit is accrued elsewhere in the system. Experience suggests that these unintended consequences are often the seed of the next crisis. Amongst their considerations of *energy*, the analysts should examine issues of *energy flow*, *attractors* and the *edge of chaos*.

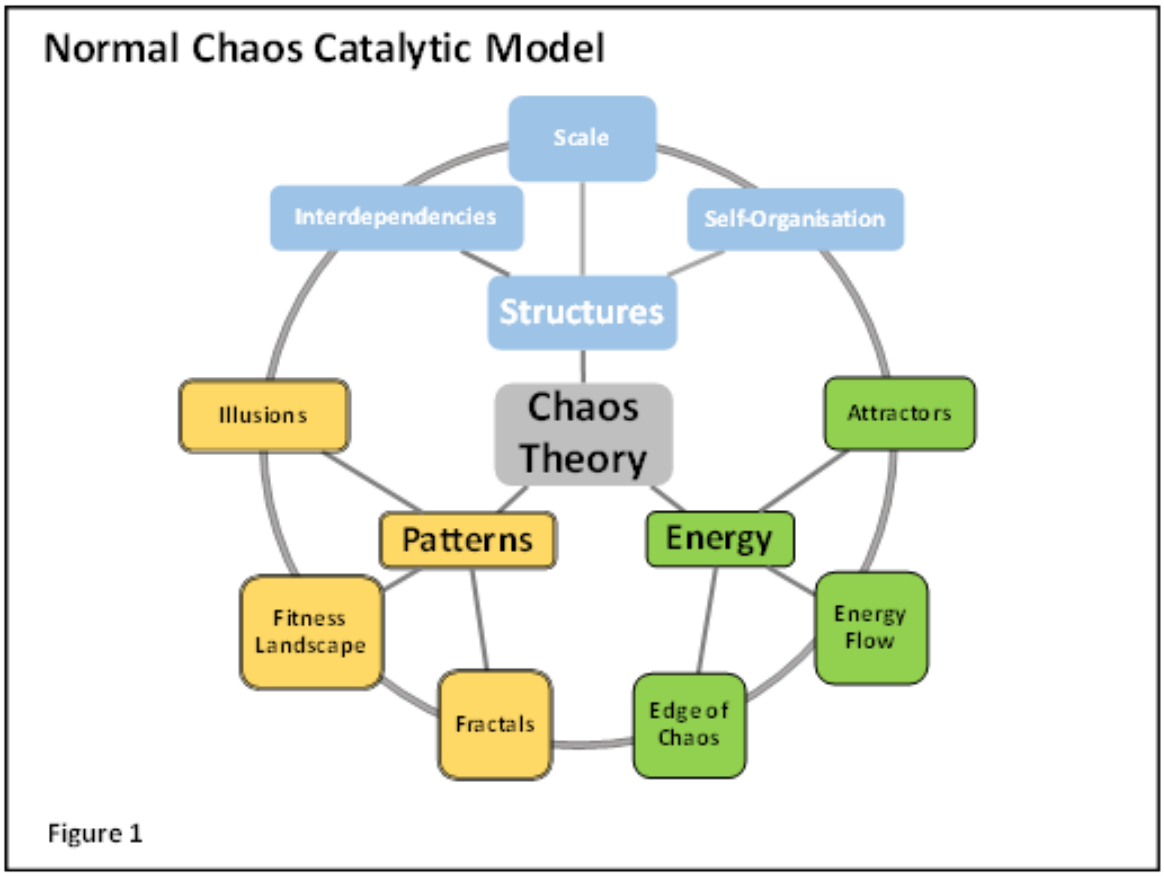
***Energy Flow*.** *Energy flow* concerns how, over time, the *energy* driving individual dynamics may change. Here the *normal chaos* analyst would consider how *energy* flows into, around and out of the system. In addition, they would be encouraged to consider how this may change individual dynamics and the direction that the *attractor* might move the organisation overall.

***Attractors*.** *Attractors* can be seen as the cumulative effect of the many, often contradictory, dynamics that will push or pull an organisation in a particular direction. For *normal chaos* the analyst's consideration of *attractors* is meant to prompt them to identify the overall heading of a system and then to identify the individual dynamics and the "*energy*" that are driving them. Once understood, action can be taken to change them as seen to be appropriate.

***Edge of Chaos*.** The *edge of chaos* concerns the identification of the "point" at which the system may fail. The paradox here is that just before this point, it is also at its most efficient. Here efficiency and vulnerability go hand in hand. The issue here is therefore to try to understand the shape of the failure curve and know the signals to look for (see for example the literature on "Weak Signals" such as Lagadec (1993:47[18]) who

defines them as “warning signals very close to the normal background noise” or Vaughan (1997:87[19]) who defined them as "one that was unclear, or one that, after analysis, seemed such an improbable event that working engineers believed there was little probability of it recurring". It should be noted that this is but part of a much wider literature on the subject of signals [wanting signs]).

By promoting discussion of system dynamics, changes over time and the potential for unintended consequences, the *normal chaos* framework looks to promote foresight. These lenses have been drawn in a framework so they can, more easily, be applied to the problem at hand. This framework is shown in Figure 1.



[Figure 1

Reference to these components throughout the paper will be highlighted by using italics.

Now we turn to applying the *normal chaos* framework to the Grenfell report

The Grenfell Report

Inquiry dynamics

While many see the inquiry process as a force for good, others have a more jaundiced view. For example, Lord Heseltine suggests that if you have to have an inquiry, you should “Reach your conclusion and then choose your chairman and set up the inquiry”[20]. In recent years the demand has been for these inquiries within the UK to become more focused on the needs of the victims. This concern creates a certain dynamic within the process. On one side, there is the fear of the victims that the inquiry will produce an "establishment

whitewash" and on another is the concern that the learning will be lost in the allocation of blame. (This issue will be addressed further in the section on blame culture.) There is always a danger that trying to satisfy one group may create an unfairness for another. The open question here is whether the desire for the inquiry to be victim focused may have had adverse consequences on its ability to learn from the events and whether issues of blame, liability and learning can be addressed successfully by a single panel.

Having said that, on the 29 Jun 2017 Prime Minister May announced the setting up of this Inquiry. In her statement she said, "I am determined that there will be justice for all the victims of this terrible tragedy and for their families who have suffered so terribly" and "we must get to the truth about what happened." On 30 Oct 2019, when announcing in Parliament the issuing of the Phase 1 Report, Prime Minister Boris Johnson said that "the residents asked for the truth, are owed the truth and would be given the truth". In the *perfect world* the truth is taken to be a singularity; in reality truth is a social construct and therefore largely subjective. This is a dynamic that will affect every deliberation (knowingly or unknowingly) undertaken and hence the comments by Argyris noted earlier. In the case of the Grenfell Inquiry, at the most basic level, some of the internal dynamics were:

- The need to determine what happened and why.
- The need to give victims a voice (to let them be heard).
- The need to hold the system to account.
- The need to learn from this event.
- The conceptualisation that the Inquiry team had of their task and their analytical method.
- The accuracy with which witnesses could recount their actions and intentions on the night.

On top of the internal dynamics are the external dynamics. While, in a *perfect world*, these should not influence the cause of the inquiry, in reality they are likely to have considerable effect. These may have included:

- Lobbying by victim support groups.
- Lobbying by those likely to be held to account.
- Politicians for their own purposes.
- The press for its own purposes.

These dynamics create an *attractor* that steers the Inquiry in an overall direction. What has to be questioned is the priority (*energy*) given to the desire to find the root cause behind the way the LFB acted that night. One of the major dynamics is the desire of victims to "see justice".

- **Victim Dynamic**

The tragic consequences of the night and their effects on the victims and their families should never be underplayed. For these people it is possible that the effects of that night may never go away. Considerable research has been undertaken to help us understand the

process of grief. A number of different models of grief development have been produced. One model has five stages another model has seven; both models suggest that an early stage is anger and the final stage is acceptance. As the Inquiry was set up shortly after the events, it is therefore to be expected that the victim group will still be very angry about why this happened to them. Two important issues need to be considered about how this might affect learning from these events. The first is how the victim dynamic may work against learning from the events. The second is what we can learn from such events about helping the victims to transition more easily to the final stage of grief "acceptance".

A key concern within the literature of learning from tragedies is the need for some groups to find someone to blame. While this is understandable, what is referred to as the "blame culture" is also likely to have adverse consequences for the learning process (for an example of this debate see Dekker, 2016[21]). Where this has been most clearly recognised is in the field of air-crash investigation. Here the process of root cause analysis and the making of recommendations has been separated from the finding of fault and liability as a better way of learning. In this instance the Snook study (Snook, 2000[22]) multi-level analysis of events that led to the shooting down of US helicopters by US fighter jets over Iraq in April 1994 is worthy of note. While at first sight it would have been easy to place all the blame on the fighter pilots, Snook traced the dynamic back to the Cold War mindset of the pilots. It should be noted that the Berlin Wall had come down less than 5 years before and so the Cold War military mindset was still in use when operating over Iraq. Snook's study is a clear example of where the true understanding of the dynamics would have been lost if he had given in to the blame culture. This body of work clearly shows that, in order to learn from tragedies, the desire to find fault and to blame needs to be resisted. The desire to learn must mean that the focus is understanding rather than blame.

The second aspect is where we, as a society, can learn how to help the victims' transition through the stages of grief to acceptance. While we know from research that the root causes of the need to blame are deeply embedded and complex, it is also quite clear that we have not yet learnt how best to manage this dynamic. The grief of the families of victims of the Hillsborough tragedy that occurred in April 1989 is still clear 30 years after those events. Looking at this through the *normal chaos* framework, the victims' anger brings an undoubted *energy* to this dynamic. The question for society is how can this group be helped to dissipate this anger (*energy*)? In technical terms this mechanism would be referred to as a *dissipating structure*. One type of *dissipating structure* used by this Inquiry team was to enable the victim group to be heard and to tell their story. This helped to dissipate the rage caused by their feeling of impotence and that their voices were not being heard. However, there is also a need to be aware of what creates more hurt and anger (therefore *energy*) within this group. The degree of complexity becomes more apparent when we start to consider what else affects this issue. Here the real complexity of the system starts to emerge. This paper considers four of these as a means of illustrating the issue of complexity.

The first of these is the consideration of what might add further *energy* to the victim group's anger. This might be caused, for example, by the use of inflammatory language by the Inquiry team or within the Report. Single phrases can inflame a victim's sense of grievance. In Para 27.31 the phrase "woefully inadequate" was used. In Para 28.89 the phrase "deplorable state of affairs" was used. It is unclear whether these were just careless condemnations or were designed to indicate to the victim groups that their sense of

grievance had been heard and was understood. What is clear is that such phrases were seized upon by the press in order add drama to their reporting. This, in turn, did reinforce the victims' sense of grievance. In addition, what this language does not do is to promote the reflexive atmosphere required to learn from such events.

Second, inquiry teams need to be aware how actions to affect one dynamic may adversely affect another dynamic within the system. This might more easily be thought of as "unintended consequences". In this case, the dynamic created by what might be seen as unfair criticism of the LFB might cause LFB personnel to be more guarded when they next speak to the Inquiry or be less likely to take the initiative if this is now seen as a bad thing to do. The question this raises is whether the Report could have provided a better balance between critique of the Service and understanding of the problems they faced. It also raises the larger question of whether this balance would even be possible in this type of inquiry.

The third issue is also one that can skew the dynamics of the inquiry process. This is the attempt to close down areas of discussion. Within the academic literature this has been referred to as "taboo data" (Kutsch and Hall, 2010:247[23]). In these circumstances the specific instances are labelled "victim blaming". This is any discussion of an action by a member of the victim group that may have had an effect on the dynamic of the situation and thereby being seen as them being partly to blame for their own predicament. However, understanding contrary dynamics is at the heart of *normal chaos* thinking. In the case of building fires we see the contrary dynamics in the need to keep fire doors closed to avoid the spread of smoke and fire, and the need to open doors to allow the ingress and egress of firefighters and their equipment; this is a normal dilemma that has no set solution. Therefore, contrary evidence about "what would have been best" must be expected and considered without the allocation of blame to one side or the other. However, within a discussion where finding blame is the driver, then the allocation of blame becomes more important than developing an understanding of the dynamics that explain why the situation developed in the ways it did. To exclude one set of dynamics because the discourse has been labelled 'victim blaming' will mean that the full dynamics of the situation will never be understood and therefore labels, such as 'victim blaming' should be avoided.

Finally, and briefly, we need to acknowledge two other forces driving the Inquiry. These are the desire for social retribution (also labelled as 'justice" as embedded in the "justice process") and the desire to learn as part of the safety enhancement process. In the latter case, the aim is more on the lines of "helping the community to do better next time". The question is whether these two goals are complementary or not and whether these dynamics move the Inquiry in the same direction or not?

In summary, a brief look at the dynamic forces that influenced the Inquiry raises concern about the *attractor* at play in the system that steered and will continue to steer the Inquiry in a particular direction. The question becomes one of whether the *structure* of the Inquiry will enable it to achieve its twin goals of social justice and learning.

Substance of the report

When reviewing the Report's conclusions and recommendation as they appertain to the response of the LFB, it is important to note the comment made at Para 28.4 and Para 28.5.

> Para 28.4 says “It is also worth repeating that, when analysing the events on the incident ground, it is necessary to **guard against making judgements with the benefit of hindsight** about decisions made under the pressure of the moment. There is a difference… between legitimate criticism of the LFB’s performance on the night and the formulation of **best practice for the future in the light of what is now known from the evidence**. I have, therefore, taken care to evaluate command decisions by reference to the information that **was, or should have been, available** to the incident commanders **at the time”** [*emphasis added*].
>
> Para 28.5 says “However, hindsight provides no answer to the significant systemic and operational failings revealed by the evidence”.

These statements raise two themes that repeat throughout this discussion. The first is the formulation of best practice based on evidence and the second is the issue of the information available on the night to decision-makers. The first brings the Inquiry team’s understanding of foresight and hindsight into question. Their statement “hindsight provides no answer” seems to undermine the whole purpose of their inquiry. Scholars would suggest that it is only with hindsight that we can see what should have been done so that system designers can reshape the dynamics of the situation in a way that promotes the desired outcome. This statement seems to be at odds with the rest of their text. The second issue raises a number of unspoken considerations. At its simplest, it fails to recognise the vast difference in nature between information that was available and appreciated for the value it brought, information that was available but not appreciated for the value it brought, and information that should have been available but was not. This final group also fragments into the many causes of why information should have been available but was not. For the report to group this complex issue into one concise phrase ("was, or should have been, available") lays the Inquiry open to the hindsight trap into which it readily falls. For it is only with hindsight that it is possible to see what information should have been available but was not. The consideration the Inquiry was trying to address was in fact "failure of foresight"; this concerns what an organisation should have been able to foresee but did not (for further explanation see for example Lauder, 2011, pp.93-169[24]). Both these issues are repeating themes throughout this paper.

The report describes the events of the night in great deal. Para 1.16 states that "Given the complexity of the disaster, it is unlikely that it will ever be possible to establish with complete certainty some of the details of what occurred at Grenfell Tower during the early hours of 14 June 2017." This statement seems very fair and a major assumption of this paper is that probably (within an acceptable margin of error) the report provides an accurate narrative of the events. From this narrative it is clear that there is room for improvement in the way the LFB conducts its operations. There can be no doubt that on that night the LFB faced a "*brutal audit*" (Lagadec, 1993[25]) of its process and, in some respects, was found wanting. It is however not enough just to identify the failures and expect that is sufficient for them to be addressed successfully. Before recommending changes, it is important to identify and understand the mechanisms of failure so that these can be addressed. Here we see a major divergence in the conduct of the Inquiry. Within their investigation of the cause of the fire the Inquiry is conducted with great insight. Although no use of the term "root cause analysis" can be found, it is clear that this was done when examining the failure mechanisms within the building. Unfortunately, this approach was not adopted when examining the failure mechanisms as they relate to the LFB's

activities. To be fair to the Inquiry team, many of the questions of why (when it comes to these failures) look like they should be addressed in Phase 2 of the Inquiry; the Report identifies over 20 of these. If that is the case, then maybe it was premature to offer criticism or recommend changes at this stage of the inquiry process. In Para 28.5 the report states that "In arriving at that conclusion (whether to evacuate or not) I am conscious that I have received no expert evidence to guide me on it and that a qualitative judgement on the approach of the LFB at the Grenfell Tower fire might be thought to be a matter better reserved for Phase 2." The report goes on "However, I am confident that, on the clear and extensive evidence about the events of the night that I have heard at Phase 1, I can and should reach that conclusion at this stage." Having said that they are confident in their own judgement, it is legitimate to analyse the inquiry methodology and judgements in more depth.

It is also important to note that the Inquiry team are not encumbered by the need to implement their recommendations. They are not faced with the issues of resource prioritisation or the politics (both with a large and small "p") that will affect the implementation of these recommendations. They are therefore free to see the world as they might like it to be rather than as it is. They are free to see the problems faced that night in June through the lens of the *perfect world* paradigm. This is an analytical lens that is commonly found in the conduct of such inquiries (Lauder, 2013[26]). However, any review of conclusions and recommendations from such a report needs to assess them objectively for their practicability. In order to learn, inquiries cannot afford to examine the world as they would like it to be; they must examine it as it is. They need to factor in the natural complexity and ambiguity that are part of everyday life. In this case study, the *normal chaos* framework will be used as the analytical lens. This paper will attempt to compare the competing logics and the implications for the conclusions drawn.

There is a second analytical issue that needs to be raised at this point. This concerns the Inquiry's focus on learning. There is a significant difference between "learning about the events" (learning about what went wrong) and "learning from the events" (learning concerned with preventing future unwanted events). Learning about the events often stops at identifying what went wrong and here the examination of "why" is limited to finding failures to comply with rules, failure of systems and equating this to negligence on behalf of some group of practitioners. However, this approach often fails when it comes to double-loop learning and in understanding the nature of dynamic complex systems with which they are dealing. This often ends up with the system being redesigned to prevent the failure that occurred while actually making the system more vulnerable to other types of failure in the future. In learning from events an inquiry needs to focus on identifying general mechanisms of failures, the resolution of which will make the system in question more robust and resilient. The Grenfell Report seems to be leaning towards "learning about the events" of 14 June 2017 rather than from them.

It is clear from the Report that the LFB had failed to learn from their experience gained at the Lakanal House fire of March 2013. The Report makes this point repeatedly. What the Report does not make so clear are the efforts that LFB made to learn from that experience (see 29.165 & 29.168); the Commissioner took time to explain these efforts during her evidence to the Inquiry. This included changes to procedures and training. Para 29.3 states that "despite these changes to certain LFB operational policies and the introduction of new

training packages, few if any lessons were learnt by the LFB." The question of why this might be has been left to Phase 2. It is however still legitimate to ask whether this might have to do with the inquiry process itself. At this stage we can but hope that the Inquiry addresses this aspect of the issue.

The Report was laid out in a narrative form: this is common practice. While this has advantages in telling the story, it also has limitations. These limitations are set out in detail by Lauder (2013). In essence this makes it more difficult for those looking to learn from the LFB's experience. It makes it more difficult to reconstruct the facts and justification for each recommendation. This logic needs to be reconstructed and understood if the recommendations are to be implemented successfully. While some might think that there is just a requirement to implement a prescriptive recommendation, in practice it is necessary to understand the reasoning in order to adapt them to specific operational environments. The first step to making sense of any recommendations is to understand the *pattern* in which they are presented. Our sense-making of the Report's recommendations is not helped by the fact they are grouped in three diverging ways. This complication is the sense-making process is illustrated next.

The first *pattern* used to describe the LFB failures was set out by Moore-Bick in his public statement when he published Part 1 of the Report. In this statement, the *pattern* used was:

- Failure to train incident commanders to recognise a fire in the external wall of a high rise or how to respond to it.
- Failure to produce a contingency plan to evacuate the tower.
- Failure to revoke the stay put while the stairs remained passable.
- Lack of effective communications between control room and the incident commander resulting in a failure to share important information.
- Deficiency in command, control and communications systems.
- Failure to provide control room staff with appropriate training to manage a large number of survival guidance calls, and
- Failure to learn from the Lakanal house fire.

The reader is then presented with a challenge to make sense of these failures in the way the narrative is constructed as the Inquiry team used a second *pattern* to construct the narrative *(see table 1).*

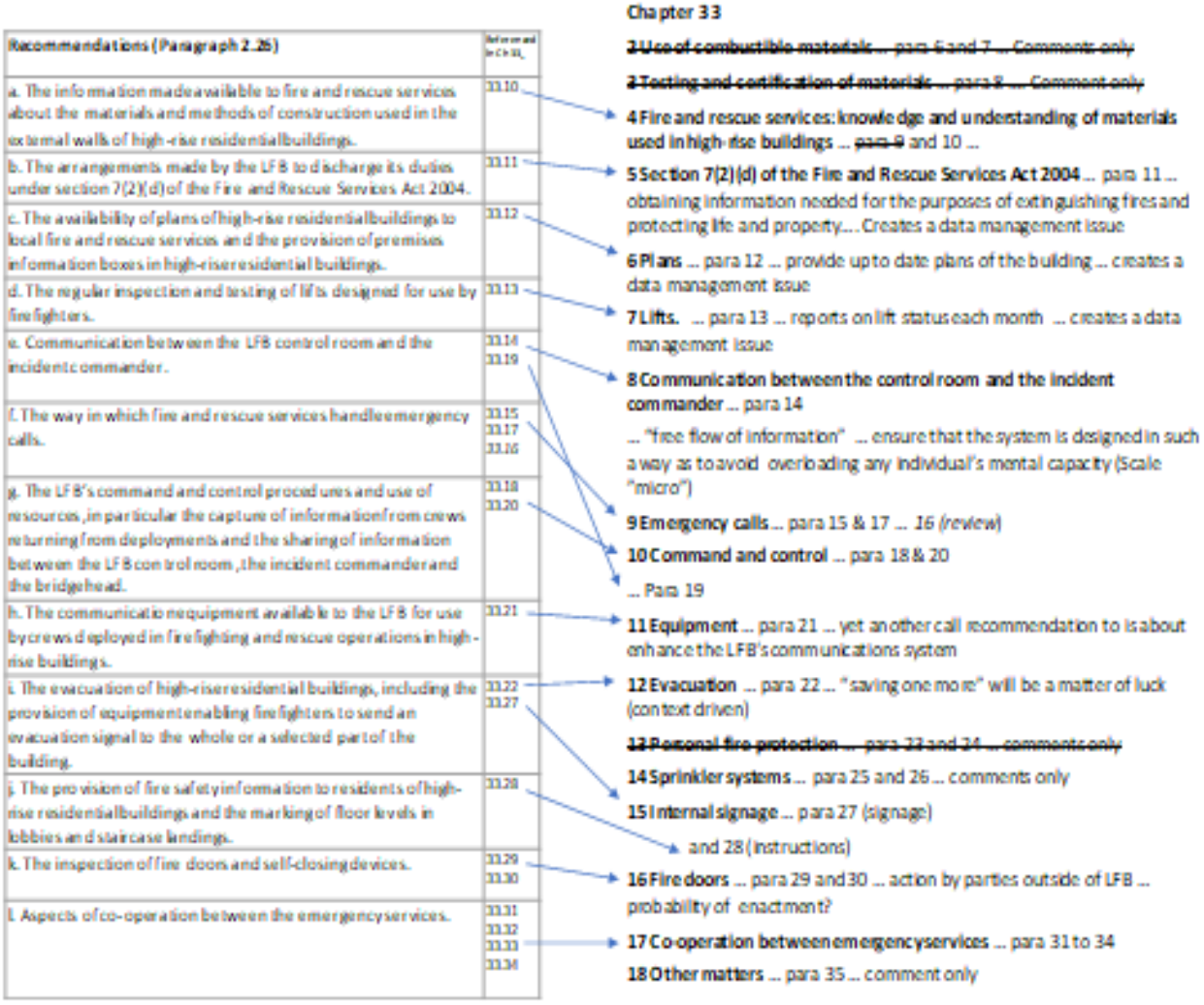
Chapter 21 The Cause and Origin of the Fire
Chapter 22 The Escape of the Fire from Flat 16
Chapter 23 The Subsequent Development of the Fire
Chapter 24 Internal Penetration and the Loss of Compartmentation
Chapter 25 Developing Conditions within the Building
Chapter 26 Compliance with Building Regulations

Chapter 27 Planning and Preparation
Chapter 28 The Incident Ground
Chapter 29 The Control Room
Chapter 30 The Response of the MPS, the LAS, RBKC and TMO
Chapter 31 Isolating the Tower from the Gas Supply

Table 1 Chapter Patterns

The problem of sense making is further compounded by Para 2.26 where the Report lists its recommendations; this produces a third *pattern*. Finally, Chapter 33 sets out the full list of recommendations. These are generally consistent with Para 2.26 but there were some variations; these can be seen in Figure 2.

In general, there is a direct read across between Para 2.26 and Chapter 33 headings. These are a to 4: b to 5: c to 6: d to 7: f to 9: g to 10: h to 11: k to 16 and l to 17. There are also some anomalies; these are e, i. and j. Subparagraph e maps to both heading 8 (Para 14) and heading 10 (Para 19). Subparagraph i. maps to both heading 12 (Para 22) and heading 15 (Para 27). Subparagraph j. maps only heading 15 (Para 28). While these anomalies might be seen just as drafting errors, they can also be seen as hinting at the complexity in the relationships between each piece of this jigsaw. What they do do is make it more difficult for readers of the narrative to link the findings of fact to each recommendation. In order to make greater sense of the recommendations, and the reasoning behind them, it is necessary to group them in a different way.



[I will work on improving the quality of this graphic]

In conclusion, while these shifting *patterns* do not prevent an understanding of the Report's recommendations, they do make it more difficult for those trying to make sense of them. Now it is time to look at the recommendations in more detail.

Chapter 33 of the Report contains the recommendations. The recommendations are set out under 18 headings. Unfortunately, the recommendations are not numbered for ease of reference, therefore the paper has chosen to refer to the number of the paragraph that contains them.

Heading 1 is "Introduction". The heading covers five paragraphs that set the scene. There are two comments that are worthy of note. In Para 33.2 the Report states that "Recommendations that are not grounded in the facts are of no value and recommendations that do not command the support of those who are experts in the field are likely to be ignored and, if not ignored, risk giving rise to adverse unintended consequences." Here the intentions are sound but from a review of reaction in the media and the reaction of the fire brigade unions, it would have been interesting to note how the Inquiry team had intended to measure their success in this area.

In para 33.5 the report acknowledges that "although not unprecedented, fires of the kind that occurred at Grenfell Tower are rare"; it is worth noting that this statement contradicts Para 1.20. This is an issue that is obscured by the ambiguous use of *scale*. In order to understand the fire and how the LFB responded to it, there is a need to know which aspects were normal and which were unprecedented. That is which facets of the fire the fire service had faced before on a regular basis, which were rarely faced, and which were unprecedented (this is one *scale*). To be more specific, Para 10.20 states that those engaged early in the process had "a combined service of 52 years as firefighters". The question here is 'so what'; in their lifetime of experience, what was relevant to what they now faced? The discussion later on cosmological episodes would suggest very little. Another *scale* is the incident overall; it was clearly unprecedented. The report seems to make no effort to understand these active *patterns* (dynamics) and to assess how these may have affected those involved on the night. Where events are new or unprecedented any analysis needs to consider the effect of what has been labelled as "liability of newness" (Stinchcombe, 1965 interpreted by Vaughan, 1996[27] & 1999[28]): there is no evidence that this occurred.

Headings 2 and 3 covering “Use of combustible materials” and “Testing and certification of materials” in Paras 6 and 8 respectively were only comments; these will not be considered further.

Heading 4 “Fire and rescue services: knowledge and understanding of materials used in high-rise buildings” contain Paras 9 and 10. Para 9 contains a preamble and Para 10 contains the recommendations. This requires that "the owner and manager of every high-rise residential building be required by law to provide their local fire and rescue service with information about the design of its external walls” and “that all fire and rescue services ensure that their personnel at all levels understand (this) risk“. In essence this is seen as being a communications issue (in this case specifically data management) and a related training issue. The value of the law in this context also needs further discussion.

Heading 5 “Section 7(2)(d) of the Fire and Rescue Services Act 2004” contains Para 11. This examines the LFB discharging of their duties under this act. The report seems to frame this as a legal issue, which they would under the *perfect world* paradigm. However, under *normal chaos* this is more likely to be seen as being a communications issue. This case is again a matter of data management; more specifically one of "obtaining information needed for the purposes of extinguishing fires and protecting life and property”.

Heading 6 “Plans” (Para 12) and heading 7 (Para 13) are also, in essence, a data management issue. Para 12 requires up to date plans of the buildings to be provided by the building owners and managers while Para 13 requires lift inspections to carried out and reported to the LFB monthly.

Heading 8 "Communication between the control room and the incident commander" (Para 33.14) also concerns a communications issue. The paragraph contains four subparagraphs appertaining to policy, training and means of communication for a specific function.

Heading 9 “Emergency calls” contains Paras 15 to 17. Para 15 is concerned with how the "CROs failed to handle FSG calls in an appropriate or effective way”. Its recommendations, contained in 5 subparagraphs, concern communications policy, training and means. Para 16

recommends a review of the related data management systems and Para 17 calls for a revision of the associated protocols (rules).

Heading 10 “Command and Control” concerns Paras 18 to 20. Para 18 is concerned with the revision of policy and training as it affects the deployment of resources and the passage of information between deployed teams and the incident commander. Paras 19 and 20 both concern issues in the communications chain between deployed assets, the incident commander and the central control room, and recommends that enhancements should be sought.

Heading 11 “Equipment” (Para 21) is yet another recommendation calling for enhancements to the LFB‘s communications system, fire-fighter to bridge head and the command support system.

Heading 12 “Evacuation” (Para 22) concerns the absence of a plan to evacuate Grenfell Tower should the need arise. The report detailed its recommendations in seven subparagraphs. These recommendations include for Government the need to "develop national guidelines"; for fire and rescue services to “develop policies and training to evacuate high-rise buildings and training to support them” and the provision of smoke hoods to assist evacuations. For the owners and managers of high-rise buildings the need to draw up and keep under regular review evacuation plans and communicate them appropriately; for those buildings to be equipped with facilities to send an evacuation signal to the whole or a selected part of their buildings; to prepare personal emergency evacuation plans (PEEPs) for all residents whose ability to self-evacuate may be compromised and to have up-to-date information about persons with reduced mobility and their associated PEEPs in the premises information box.

Two points need to be noted at this stage, they will be addressed more fully later in this paper. Firstly, the Report specifies ‘residential’ buildings; a danger of taking this Report, as written, is that it makes fire and rescue services focus on residential buildings to the exclusion of other vulnerable venues thereby leaving the system open to other failure scenarios. The second point is that this recommendation sets the onus of producing the evacuation plans with the Owners and Management of the buildings; on the other hand, the Report places the responsibility for the failure to have a plan at Grenfell Tower on the LFB. This seems to be an anomaly.

Headings 13 "Personal fire protection” (Paras 23 and 24) and Heading 14 “Sprinkler systems” (Paras 25 and 26) only provide commentary and so will be considered no further. Heading 15 “Internal signage” (Paras 27 and 28) and Heading 16 “Fire Doors” (Paras 29 and 30) are actions required of parties outside of LFB. Here the consideration for the LFB is the probability of these recommendations being enacted (*patterns* as an *illusion*) and so how they will be factored into the LFB’s risk assessments.

Heading 17 “Co-operation between emergency services” runs from Paras 31 to 34. Para 31 concerns the effectiveness of communication systems; in this case between the three major emergency services. In four subparagraphs it offers declaratory statements emphasising compliance with the existing procedures. Para 32 and Para 33 are also concerned with tri-service communications effectiveness. Para 32 concerns data logging and exchange and

Para 33 concerns the data link with the helicopter support. Finally, Para 34 is concerned with another data management issue and, in this case, the specifics are the “information about survivors and making it available more rapidly to those wishing to make contact with them”.

Finally, Heading 18 “Other matters” (Para 35) is only commentary and so shall not be considered further.

Summary of Recommendation

The challenge to understanding these recommendations is to reconstruct the narrative in a way that provides a clear link from the recommendations through the conclusions to the finding of facts. In this way the recommendations are supported by an analysis of the finding of facts. This approach is consistent with "evidence-based management" and the academic process. This is at odds with the narrative form in which the Report has been produced.

The difficulties in reconstructing the Inquiry’s thought processes hints at the complex relationships that exist within the scenario described. Part of this complexity is created by extraneous information that clouds the overall picture. In the case of the recommendations in this Report, the clutter is created by Paras 1 to 3, 9, 23 to 26 and 35 as they require no action (these have been ruled through but are included for completeness). It should be noted that when this paper refers (in shorthand) to "Recommendation 10”, for example, it is in fact referring to the recommendation made in paragraph 33.10. Therefore, in summary, there are 35 paragraphs in Chapter 33 "Recommendations". Of these:

- 14 (1 to 9, 23 to 26 and 35) contain statements, comments and non-recommendation and so can be excluded from consideration for further action.
- 7 (10, 12, 13, 22 and 28-30) contain recommendations that an action be specified in law. All these actions are required by building owners and managers.
- One recommendation (Para 22) suggests that fire services be equipped with fire hoods to assist evacuation.
- 7 (10, 11, 14, 15, 18, 21 and 22) contain recommendations that identify issues of inadequate training.
- 15 recommendations concern inadequacies within command and communications arrangements on the night.
    - 8 recommendations (14, 15, 17 to 19, 21, 31 and 33) raise issues over the fire service’s capability and procedures (micro issues),
    - 3 recommendations (11 to 13) raise data management issues, and
    - 4 recommendations (16, 20, 32 and 34) suggest that reviews should be conducted.

The two themes that cover most of the recommendations are training and communications. These themes are common to most inquiry reports (Lauder, 2013). This would suggest that these are not simple issues to resolve. There have been many attempts to do so and many suggested solutions. None of these have, as yet, provided “the Solution” as these themes continue to reoccur. Therefore, if the public is not going to be given unrealistic expectations (an *illusion*) then reports such as this need to be clearer about what is actually achievable.

Some of the recommendations (see Paras 14, 15, 17 to 19, 21, 31 and 33) advocate micro changes (small changes to a process). While, on the surface, these might appear to be the simplest to achieve, they also bring their own risks. The first risk is that they produce a suboptimal outcome. One example of a potentially sub optional outcome has already been identified; this is the stressing of "residential buildings", distracting from other buildings or scenarios that might involve a large number of casualties. The second is the issue of unnecessary change. As the Report also recommends major review and changes to communications systems, there is an issue of whether the major change makes the micro changes redundant. The imposition of unnecessary changes adds vulnerability to any system.

Simply looking at the recommendations (even with the preambles given in Chapter 33) does not explain or justify them. To understand them further we need to go back into the body of the Report to find more context. To understand the recommendations and their context we need to understand what the Report saw as failures.

Examination of the perceived failures

The report used the label "fail" 181 times. This included "failed" 66 times and "failure" 88 times. The important issue is however, what they deemed to be a failure. Chapter 24 accounts for over 30 of these references. As they concern why compartmentation failed, they are outside the scope of this paper and will not be considered further. The failures that concern this paper are those in the planning process (Chapter 27), the ground operations on the night (Chapter 28) and in the control room (chapter 29). Each will be examined separately.

At the start of Chapter 27 the implications for learning of the Inquiry's *perfect world* approach is made clear. Para 27.3 States "It is quite plain that, as a matter of national policy and guidance, a fire and rescue service is obliged to ensure that it has contingency plans in place for the partial or full evacuation of high-rise buildings in its area in the event that the "stay put" strategy becomes untenable." There can be little dispute that the directive is clear and its goal is laudable. However, by applying double loop learning, the Inquiry needed to question whether what is being asked is practicable. It is also true that the fire service "cannot take it for granted that the building is adequately compartmented in accordance with the Building Regulations". Again, here there is a clear issue over whether a *fantasy document* clashed with the realities of practice. This has major issues for what is learnt and will be examined in more detail later. The key philosophical question here is whether it is reasonable for any fire and rescue service to be expected to make good every gap created elsewhere in society. In fact, the Report even notes the words of Dr Lane who stated, "I do not consider it reasonable that … the fire brigade should be expected to fully mitigate any resulting fire event" (Para 28.3). And yet, the Report points to every slip, lapse and error (Reason, 1997:71-73[29]) of judgement as being a failure. Seen from the perspective of the relevant academic literature, this expectation of perfection is an *illusion* and cannot be set as a realistic basis for future operations. From the perspective of learning any such inquiry needs to be clear about what should realistically be expected of service providers.

In chapter 27 most of the failures concern decision making. Here we can use the simplified "see, appreciate, act" model (Lauder, 2011:18) of decision making as an aid to the textual analysis. ("See" would cover words like identify. "Appreciate" would cover words like

expect or discover. “Act” would cover words like train, inform, carry out, implement, correct, make good, demand.) To the Inquiry, these are all seen as being part of a simple process rather than being part of a far more complex reality. Seven times the Report asserts that something was or should have been “obvious”. If these issues had been truly obvious then the person in question would have appreciated them for the signal they provided. The fact that they should have been obvious therefore can be seen only to hold true in a *perfect world*: assertions such as these are clearly a product of hindsight. Within the academic literature all these "failings” would be seen as being part of a much more complex issue. This has been labelled “failure of foresight” (Turner, 1976[30]). This body of work seeks to explain why apparently simple decisions are much harder to make in practice because the information needed is obscured by the noise of everyday working life. While in a *perfect world* it is regrettable that the failures identified were made, if the Inquiry hopes to prevent them in the future, they must understand the dynamics that caused them.

While Chapter 28 lists a couple of technical failures (Compartmentation and the heli-tel downlink), the Chapter mainly cites more failures in the decision-making process and then adds to these ’failures of command’. The Report however fails to define its expectations of command and commanders. While the *perfect world* paradigm might see the commander as an all seeing, all knowing hero figure who operates as an infallible director of activity, it is important to note that this model of leadership does not match current thinking on this subject as discussed further later in the paper. On six occasions the incident commander was criticised for failure to acquire or communicate some form of data without considering the context. The *perfect world* approach does not even consider the actual mental capacity of an individual when stressed. For example, Para 28.45 states that it does "not think that his failure was due to any personal lack of ability or commitment. Rather, it was due to deficiencies in his training which failed to equip him with the means of deciding” without considering whether any individual, when stressed, would be able to absorb, retain and deploy such specific ideas alongside everything else he or she was required to know and use. Again, this will be addressed later in the paper.

Within the decisions to be made that night, clear in hindsight, were the issues of compartmentation failure, the strategy used (together with the deployment of resources) and the part to be played by the LFB trying to respond to Fire Safety Guidance (FSG) calls. The analysis provided in Part 4 of the Report is confusing. It seems to handle the three items separately whereas they are all interrelated. The key question unanswered would seem to be whether a fire service should focus of getting as many people to safety as possible or they should focus on responding to the FSG calls. The second order question is whether these two issues are complementary or at odds with each other. For the Report not to have addressed this can be seen to be a major failure on their part as it would set the context for future operations.

Chapter 29 focuses on the actions of the control room. Again, the Report lists detailed failures in the procedures and policies, and failures of individuals to conform to these policies. What the Report does not do is to set the activities of collecting or disseminating information within context. It goes so far as to suggest that the context was not an important factor (Para 29.55). In this case the context was one of an organisation that was facing an unprecedented situation many times worse than it had ever experienced. It is quite clear from the description provided by the Report narrative that individuals were close

to having *cosmological episodes* (Weick, 1993:632[31]) and that the organisation was operating very close to the *edge of chaos* (see work by Rochlin (1991: 117[32]) on 'losing the bubble'.) Here the key question for learning is one of politics not operations; the question is how much redundant capacity politicians are willing to pay for when it is likely to be used rarely. To expect individuals to perform faultlessly when under such stress might be seen as a form of *illusion*. Before any redesign is undertaken, it is important to understand how individuals cope when stressed so that the system can be designed to take this into account and thereby reducing the potential for failures in the future. As far as the operation of the control room was concerned, the Report seems to overlook the main function of the control room and that is to control the activities of LFB overall and not just to act as a communications node for a single event. Any design of the system needs to consider the potential for simultaneous incidents and the control room's ability to handle multiple events.

The remaining list of failures all fall into the categories discussed above and so it would add nothing to detail them any further here. The key point overall, from the perspective of learning, is that most of the failures cited did not take into account context: it is context that adds the complexity to any situation and it is the context that is the primary dynamic from which failures *emerge*. Therefore, while the correct actions recommended by the Report can be seen to be logical from their perspective, the lack of context means that no root cause analysis has been conducted and no real understanding of the issues yet exists. The Health and Safety Executive suggests that investigations should be conducted based on iterations of the question “why” (it should be noted that some organisations recommend using “Five whys”, some “Seven whys”). This is designed to get to the underlying causes, rather than just seeing the superficial causation. This best practice has not been used when examining the actions of the LFB and so any recommendations must be treated with caution in case their implementation has unintended consequences. A key feature of the Report's criticism of the LFB’s actions was that on numerous occasions they failed to follow procedure. This brings into question a central pillar of the *perfect world* paradigm and that is whether it is even possible to produce the perfect rule set.

Rule-Based Approach versus Principle based

The Report recommends that seven actions be prescribed in law and a further one in regulation and cites compliance failures on numerous occasions. It is clear that the approach taken by the Inquiry team is that the solution is first to write a rule and then to follow it. As this seems to be so central to their thinking, it is necessary to take some time to examine its validity. The key issue here is whether this approach works and whether it will prevent such things ever happening again?

While those who practise law might see the written words as setting the criteria that needs to be tested, operational practitioners hold a different world view. Von Moltke (the elder; 1800-1891) is widely misquoted as having said ‘No plan survives contact with the enemy’. A popular Israeli Defence Forces slogan is that ‘plans are merely a platform for change’. Historian John Keegan said that all battles are ‘in some degree disasters’. An example of this

latter point comes from Operation Desert Storm; ‘planners were seeking to develop plans that would ... last 72 hours … However, plans actually survived only an average of 9 hours.’ (Albert & Hayes, 2007:101[33]). Eisenhower is quoted as saying ‘plans are useless, but planning is indispensable’. A more recent debate on this issue can be found in Bieder and Bourrier (2013[34]) and it can also be seen in the argument between normative and principle-based regulation. This clash of approaches can be clearly seen throughout the Report.

- **Reliance on Plans and Policies**

The Report quoted from several policy directives (for example Section 7(2)(d) of the Fire and Rescue Services Act 2004, PN633 and GRA 3.2) without applying "double-loop learning" and considering whether they might fall into the category of being *fantasy documents* (Clarke & Short, 1993[35]). *Fantasy Documents* are "plans and policies created to cover bureaucratic gaps but, if scrutinised, would be seen as "unfit for purpose'". While these documents might be seen as acceptable to a bureaucratic audit, they fail when tested by the circumstances with which they were meant to contend. These "*brutal audits*" (Lagadec, 1993), such as the fire at Grenfell, test policies and plans to destruction. Such *brutal audits* take plans to the *edge of chaos* and beyond. They demonstrate where plans do not have the necessary robustness. For an example from the Report, we can look at the discussion of PN633 (the LFB’s policy for fighting fires in high-rise buildings). In Paragraph 27.24 the Report discusses evidence taken on the validity of PN633. It reports that after the *brutal audit* provided by the Grenfell fire, the Commissioner described many of the aspects of the policy requirements to be “incorrect” and “not realistic.”' The questioner then remarked that to him "it is not clear how the LFB came to produce such a flawed policy." (It is noted that this may be addressed in Phase 2.) However, to those aware of the literature, this comes as no surprise at all. This raises the question of whether plans can or should be relied upon. However, before we do this, we need to try to understand why such rules are broken.

Throughout the Report there is reference to rules being broken, to procedures being violated; however, there is very little discussion of what causes the rules to be broken. In order to learn from such events, it is necessary to understand the dynamics involved. For the purpose of this paper, we will examine just three of the many pieces of work looking at this issue. This is work by Perrow, Reason and Hollnagel. Charles Perrow's (1999) introduced the notion of an "*Error inducing organisation*". Perrow lists 11 dynamics (see side bar) that induce staff to break rules. These dynamics are seen to be common to many organisations. Here the issue becomes one of how to reduce the potential *energy* of each dynamic thereby reducing the error inducing *attractor*. The second area of work is that of James Reason (1997). He examined the nature of rule breaking or "violations". He produced five categories of violation. These were *routine violation*s where a rule is broken as a norm (for further explanation see Vaughan, 1997[36]; *Normalisation of Deviance*): *necessary violations* where the rule does not work: *exceptional violations* where circumstances make the rule invalid; *optimising violations* to make the process run more effectively and finally *malicious violations* designed to sabotage the system. The majority of these types of violations are meant to improve rather than harm the system. To understand why people do this, we have to look at our third area of work. This is what Eric Hollnagel calls the ETTO principle[37]. The ETTO principle (Efficiency Thoroughness Trade Off) describes a very important system dynamic; it describes the constant trade-off between being thorough and being efficient. It is at the heart of Vaughan's (1996[38]) idea of *production pressure* and the Type 1 and Type 2

errors delineation (Type 1 error being organisational failures in the form of an accident; Type 2 error is an organisational failure due to bankruptcy caused by gross inefficiency (that is building too many safeguards). The important point here is that in order to manage rule violation it is necessary to understand the dynamics that cause them. Before this point may be accepted it is necessary to ask the question whether total compliance with rules is even possible.

Dynamics of Error Inducing Organisations

(1) authoritarian organisational structure [Centralisation of power];

(2) where group and power interests exist;

(3) where latency period of problems may be longer than any decision-maker's career';

(4) ambiguous cognitive model that enables an inaccurate mental model to be created;

(5) dysfunctional systems/ processes;

(6) “forced errors" - ["do wrong or be sacked"];

(7) where "prescribed" behaviour is hard to enforce;

(8) where the system does not breed cooperation;

(9) where there are economic pressures to perform ["Production Pressure"]: where failure appears to be continuous, but recovery is possible;

(10) where complex equipment is barely maintained; and

(11) where blame is transferred outwards from the centre

Scholars have examined whether systems can rely on the faithful execution of rules (referred to as "*Verbatim compliance"* - Schulman, 1993:357-8[39]) as a way to avoid system failures. Schulman argues that while much of the previous organisational theory would mean that ‘it is reasonable to expect a high degree of rigidity and formal rules’, he advocated caution in the use of such an approach. Hirschhorn goes one step further in his research on a nuclear power station. Even when working in a seemingly static and highly regulated facility he concluded the rules per se did not work. He saw that some seemingly minor complexity thwarted the verbatim implementation of the rules. In the language of *normal chaos*, complex and dynamic situations defeat pre-prescribed remedies due to *emergence*. Hirschhorn suggested that management needs to develop two classes of procedure. The first should be ‘broad in scope and applied to a wide range of circumstance’ and strictly applied. The second should be detailed and specific but employees are free to vary it ‘as long as they fulfil its intention’ and remaining within the boundaries set by the first type of rules (Hirschhorn in Robert, 1993:148[40]). It should be noted that the International Standards Organisation configures their documents in a similar way. They suggest four categories of action. These are "shall" indicating a requirement [mandatory], "should" indicating a recommendation [non-mandatory], "may" is used to indicate that

something is permitted and "can" is used to indicate that something is possible. [At this point it is worth noting that in both Paras 27.22 and 27.23 the Report states that '"should" means "must"'; this raises the implication about being clear what individual words mean as the dynamic created by what these two words mean is quite different]. Finally, Snook (2000) identifies what he calls *practical drift*. This is the divergence over time between the rules as set and the circumstances they are meant to address; this is consistent with the idea of Incubations in Turner's Disaster Incubation theory (Turner, 1976 a[41] and b[42]). This means the more rules you have, the more bureaucratic effort is required to keep them aligned with context. This effort can drive an organisation towards a type 2 failure. The weight of academic literature clearly shows that the way plans are constructed at present makes them prone to fail. This suggests that there is a requirement to re-examine the role and format of these documents. This, in turn, is linked to differentiating between mandatory and advisory action and the role played by training, command and initiative and differences in perspective created by the *perfect world* and the *normal chaos* paradigms. This will be examined next.

In order to understand the answers, it is necessary to understand the context in which the questions were asked. The problem of making sense of the recommendations is increased as the Inquiry process was "inquisitorial in nature" (Paragraph 1.17). While this process is deemed appropriate for the justice system, it is questionable whether it is appropriate as part of a learning process. Within the judicial system, the inquisitorial approach is based on two sides debating the law (a set of rules): each side taking an opposing stance and arguing their case. Each side attempts to make the evidence confirm their proposition. There is plenty of evidence from the transcripts of the questioning of witnesses that this approach was the one used by the Inquiry team. The application of this approach, coupled with the Inquiry team's questioning being prone to "confirmation bias" and their poor use of hindsight, means that this approach is seriously flawed as a way to learn lessons from the past. There was also clearly no meeting of minds between the questioner and the witness on important issues that will affect future success. They were mainly ignored by the Inquiry team. To explain this statement, examples will be taken from the questioning of Commissioner Cotton on 27 September 2018 (see Video 1[viii] and Video 2[ix]).

At the end of over six hours of giving evidence (standing up all the while), Commissioner Cotton was asked the question "If there was one aspect of the London Fire Brigade response that you could go back and change, what would it be?" Her reply "that she would not change anything about the response of the LFB on the night" received widespread opprobrium from the press and in the report. Paragraph 28.55 talks of her "remarkable insensitivity to the families of the deceased" and "the Commissioner's evidence , even with the benefit of hindsight, only serves to demonstrate that the LFB is an institution at risk of not learning the lessons of the Grenfell Tower fire." This statement shows a weakness in the inquiry process.

[viii] Video 1 -https://youtu.be/4dHInKzgxyk accessed 4 Jan 20

[ix] Video 2 - https://youtu.be/YMiLHc_xMS0 accessed 5 Jan 20

It is important to note that the Commissioner was not asked to answer using hindsight. She continued to answer from the perspective of what was known at the time. The validity of the comment made in Para 28.55 has to be questioned. If the questioner had not intended to base his question on hindsight, then the Report cannot expect the Commissioner to reply using hindsight. If the questioner accepts that the premise of the question was hindsight, then the Report's comments on the use of hindsight are clearly false. To understand this point there is a need to examine the context of her answer. There is a need to understand the questioning she had faced over the course of the day.

The day was a tussle of two, possibly incompatible, perspectives. Despite the Report's insistence that it would resist the hindsight trap, the questioner fell into it completely. [It should be noted that the reference to the "questioner" is due to the fact that who the questioner was is not important; the *pattern* of questioning matches that of questioners in other inquiries (See Lauder, 2013).] All his questions were premised in hindsight (for they were based on information only available after the events) where the expectation was the exposure of imperfections (as he saw them) in the LFB's systems. The questions were all focused on collecting the evidence the questioner needed to support his proposition (therefore being confirmation biased) rather than questioning the witness in the spirit of exploration. In all her answers, Commissioner Cotton premised her replies in foresight; she premised her replies on what her officers would have known at the moment they made the decisions (see minute 31 of Video 2). In summary, the questions were being asked from the basis of hindsight and based on the expectation of producing a *perfect world*. The answers were given based on foresight and the Commissioner's knowledge of an imperfect system. In this context the final questions, which did not ask the Commissioner to apply hindsight, were clearly answered, once again in line with all the others, from the perspective of foresight, what she knew at the time. There was clearly no meeting of minds. What is of concern is that where the questioner did not like the answers given (for many of them clearly frustrated him) he seemed happy to ignore them especially if they did not support his premise (that is clearly *confirmation bias*). From the evidence of the recordings it is not possible to tell whether the questioner has a true desire to learn which, if true, would undermine this aspect of the inquiry process.

The Commissioner was repeatedly pressed over the training of firefighters in respect of their ability to recognise the threat posed by flammable cladding. The Commissioner's reply emphasised the multitude of threats faced by firefighters which lead to the need of the service to prioritise training. She explained that due to the relative likelihood of cladding fires, this threat received a lower training priority: this approach is consistent with research that examined the "viability of multi-skilling" (Lauder, 1997[43]) which, while it might only be considered to be a weak signal, does provide a warning. The research on multi-skilling identified the limited number of skills that can be held and maintained by individuals dependent on the complexity of a skill and the regularity of its use. This work showed that individuals have a limited capacity to retain such knowledge and that *skill fade* (another form of *drift*) is an ever-present consideration. Yet despite having given her answer, the questioner repeated the question in different forms many times. He fails to accept the Commissioner's point and seemed to expect individuals to have an infinite learning capacity: this would be another *illusion*, consistent with the *perfect world* paradigm, which undermines the detailed recommendations.

The questioner also probed the Commissioner on the subject of leadership. Again, there was no meeting of minds on this subject. The Commissioner's comments on leadership were consistent with objective based leadership (known by the military as "mission command" or "auftragstaktik"). This is also consistent with HRO thinking. The basis of auftragstaktik is that once the subordinate is given the commander's intent (this sets the activity boundaries; the *attractor bowl* in *normal chaos* terms), then the subordinate "gets the job done" applying flexibility and initiative (*self-organising*) where required. As subordinate initiative is vital to mission success, they must be encouraged to use and develop their initiative. This approach is questioned by the Report in Para 33.18.

Para 33.18 states "Too often firefighters or junior officers acted on their own initiative, resulting in confusion and duplication of effort." What is not clear is whether the Report is against all use of initiative or just in this case. Evidence from the Report would suggest that they are not totally against the use of initiative; see Paras 13.85, 28.105, 28.111, 29.40, 29.83, 29.93. In practice it is accepted that every approach to command and control (including *auftragstaktik)* will come with downsides along with its upsides. On balance, *auftragstaktik* is seen by many to be the best approach overall when faced with high intensity operations. It is safe to assert that the recommendations made in Para 33.18 will never produce the perfect system desired by the Report because micro-management is the premise on which the recommendations are made. This is safe to assert for it has been rejected by both practitioners and scholars many times over the last 50 years. The total lack of evidence that their proposals would produce a more satisfactory outcome, lends further weight to the argument against using these inquiries to learn from past events. Again, consistent with *auftragstaktik,* the Commissioner explained the need to divide up the duties amongst the command team and the need for decisions to be taken at the appropriate level of the organisation (this is a central tenet of HRO thinking). This model of leadership is in direct contrast to the command and control model that seems to be in the minds of the questioner. The command and control model is predicated on the myth of the "all seeing, all knowing heroic leader"; while it is associated with the military, this is another myth (*illusion*). This model of leadership has not been predominant in the British military, or its allies, in the last 50 years. This view of leadership can be seen in the comments at Para 28.4 which speaks of "information that was, or should have been, available to the incident commanders at the time**"**.

This point is emphasised by Para 33.14 which talks of the need for a "free flow of information between the control room and the incident commander" as if it would simply, by itself, improve communications. However, as in all things, more information brings its own problems. In most cases this approach quickly leads to overload of both the communications means and the individual and hence the widely recognised need to split duties across a team rather than vesting sole responsibility in the incident commander. The incident commander's task is to ensure that all activities are aligned. Practitioner experience and academic literature both suggest that the ideal communication structure has yet to be found (see for example the comments made by Kerslake (2017[44]) after the Manchester Arena bombing inquiry). The approach being adopted within the *normal chaos* research team is to examine the network structure created by such events, determine the information needs based on the *interdependencies* within that structure and design a system that satisfies those needs. The aim here is to filter out the "noise" (rather than

encouraging free flow) enabling each stressed actor to receive just what they need and are able to cope with. As no ideal system has yet been devised, research is still needed.

Seven recommendations point towards training deficiencies. This gives a view on the Inquiry's attitude towards training and is consistent with the *perfect world* paradigm. The questioner's approach seemed to suggest that in a perfect system every aspect should be covered by formal training programmes. However, this stance does not take into account much of what academic studies have taught us about how we learn. The questioner's premise that the only valid learning comes from formal training overlooks the fact that most learning comes through trial and error. We learn from experience and we self-teach (the clearest example of this is researchers who discover in order to inform others!) The academic literature suggests that a lack of formal training does not equate to not knowing. However, this false premise underpinned the questioner's position. Again, we can see how the *perfect world* paradigm provided the foundation for his arguments. Here perfect training would produce perfect knowledge and the information held should have led to perfect outcomes. Based on *perfect world* thinking the Report criticises failure of the LFB to learn from their experience at Lakanal house and asserts that there is the risk that the LFB might fail to learn the lessons from their Grenfell experience. In the case of Lakanal house the attitude seems to be based on the premise that, as they had experienced the issues at Lakanal House, they should not have been thwarted by similar issues at Grenfell. This attitude is clearly based on a *perfect world* where knowledge instantly becomes perfect actions. In contrast we can see how the Commissioner tries to put Lakanal house learning into perspective. In her evidence she repeatedly pointed to what had been done as a result of their Lakanal house experience. The sheer complexity of turning knowledge into perfect action seems not to have been considered by the Inquiry team. To see as a failure that LFB knew the lessons of Lakanal but failed to turn them into perfect practice says more about the Inquiry team's understanding of the learning process than it does about LFB's willingness to learn.

Five recommendations (33.10, 33.11, 33.14, 33.15 and 33.18) specifically refer to the need for more training. This however is not the full story. Para 33.9, not a recommendation, says "the more junior levels … were not trained to recognise the nature of the fire that occurred at Grenfell Tower" suggesting a further deficit in training. What the report overlooks is the fact that every recommendation brings changes that will carry a training burden. Every skill acquired will be vulnerable to skill-fade and so will require refresher training. The danger of the Inquiry Report mandating training is that the mandate comes with unrecognised opportunity costs (things not done). As well as an actual resource cost, this mandated training may be out of alignment with the daily demands of the service. Within its *perfect world* paradigm, the Report offers no "stop line". This is the point at which an occurrence is deemed to be so rare it can remain unaddressed. Unless this debate is had, the LFB would be expected to develop a training package to respond to "something that simply shouldn't happen", or as the Commissioner stated more graphically, "for a space shuttle to land on the Shard" (Para 27.17). This level of training is clearly not practicable. To suggest otherwise is to offer the public another *illusion* of safety. An alternative approach to training, based on further research and political guidance, needs to be developed, the heart of which should be competence modules through which the commanders are taught to "bricolage" (Levi-Strauss, 1966[45]): bricolage is defined as improvising with a mixed bag of tools and tacit knowledge to adapt to the task at hand.

The recognition of the need for *bricolage* (with its implicit requirement to *self-organise*) is at odds with the world seen through the *perfect world* paradigm. This would suggest that there is a clash of cultures between those who conduct these inquiries and the practitioners who have to implement their recommendations. The important question is whether this difference is wide enough to invalidate the recommendations they make.

Clash of Cultures

In his submission to the Inquiry published on 1 Nov 19, Mr Steve McGuirk (a former Chief Fire Officer) made the point that "apparent straightforwardness and simplicity can be illusory and can obscure appreciably greater ambiguity and complexity" (para 1.10 on page 2). This is consistent with the *normal chaos* approach. It is therefore necessary to consider the issue surrounding the recommendations in terms of systems. For the purpose of this paper we will consider two interrelated subsystems within the whole. The first concerns "stay put" and the second "communications".

- The Stay Put concern is addressed in two recommendations. These are:
    - Incident commander not trained to recognise a fire in the external wall of a high rise or how to respond to it. (Para 33.10)
    - No contingency policy (or plans) for the evacuation of towers (Para 33.22.)

  In systems terms, these issues can be seen as relating to "keeping occupants safe".
- The second group all concern communications. These include:
    - Lack of effective communications between control room and the incident commander resulting in a failure to share important information (Para 33.14).
    - Service deficiency in command, control and communications systems did not work properly (Paras 33.14, 33.15, 33.17 to 33.19, 33.21, 33.31 and 33.33) plus (Paras 33.11 to 33.13) that considered data management issues.
    - Not provided control room staff with appropriate training to manage a large number of survival guidance calls (this is also seen as a failure to learn the lessons of the Lakanal house fire, see Para 33.9.c).

  In systems terms, this is effectively management of decision support data.

For the purposes of the discussion, it is easier to divide the issue into two subsystems. However, it is also clear that there is a link between the two for, without the appropriate data, the incident commander would be ill equipped to decide how best to keep the occupants safe.

- **Keeping the Occupants Safe**

The issue at the centre of the residents' concerns is the safety of occupants living in high rise buildings. The principal strategy adopted by many fire services throughout the world is called stay put. Based on the expectation that the fire will be contained within a defined area for between 30 mins and an hour, experience has shown that this has proved to be, in the vast majority of cases, an effective approach.

On the understanding that "every system is likely to fail at some point", a robust system to ensure occupant safety would be to have an alternative plan is place. The first item to consider is why the planned containment might fail. The criticism of the recommendation that "all fire and rescue services ensure that their personnel at all levels understand the risk of fire taking hold in the external walls of high-rise buildings and know how to recognise it" (Para 33.10.b) is not that it is wrong in itself but that it is too prescriptive. Containment may fail through many mechanisms, some known and, no doubt, some yet to be discovered. Fire and rescue services should be encouraged to explore all potential failure mechanisms so that the commander responsible for revoking the stay put advice keeps an open mind on the various possibilities.

The second issue pointed out by the report is that there was not a plan to evacuate the tower. This is covered by Recommendation 22. This recommendation hints at some of the complexity involved as it comes in seven parts (a. to g.). The recommendation includes the need for governmental guidelines, LFB to have policies and training, and 4 recommendations for the owners and managers to produce the evacuation plan (three enforced through the law). All these parts need to align if this contingency strategy is to work.

The final part of this recommendation concerns the provision of an unspecified number of smoke hoods to assist evacuations. It should be noted however that no justification or even argument can be found to support this suggestion (contrary to the Report supposedly being evidence based). As with all such ideas, it will bring with it advantages and disadvantages; none of this was debated. However, this kind of recommendation provides a hostage to fortune. Should the fire service debate this option and reject it for sound reasons, it is still likely that, if at another time people die from smoke inhalation, that service would be (unfairly) criticised for not implementing this recommendation.

At Para 23.48 the Report states "I still find the speed at which the fire took hold of the building … profoundly shocking … to any onlooker those first few minutes must have been truly terrifying." While firefighters are trained and conditioned to cope in circumstances that would overwhelm many others, they can still reach a point at which they too will be overwhelmed; in these cases it is the failure of *pattern* recognition that leads them towards their personal *Edge of Chaos*. Weick (1993:632[46]) refers to such circumstances as being a "cosmological episode". "Several LFB witnesses said in one way or another that they did not understand what was happening as the fire spread up the building and that buildings 'should not behave like that'" (Para 27.9). While the Report accepts the complexity of the physical environment (Para 23.62), it seems to fail to acknowledge the strain this would have put on the firefighters and the overall decision-making process (both at the micro and macro levels). Here it is important to understand the issue of *scale*. It is not the LFB (macro *scale*) that makes decisions, it is the individuals (micro level) who work for the LFB and make these decisions on its behalf. The macro level decisions (those attributed to the LFB overall) are just an emergent characteristic of the accumulation of the micro.

In such an unprecedented fire, "cosmological episodes" are to be expected. Further evidence for this comes from Paras 28.28, 28.46 and 28.71. Para 28.28 states "By 01.50 WM Dowden had been acting as incident commander for the best part of an hour ... The behaviour of the fire was outside his experience and nothing he had done appeared to be

having any effect. He was at a loss to understand what was happening or to know how to respond"; in Para 10.99 he said that "by the time he had made pumps 15 all his previous experience 'had gone out of the window. Very daunting moment. I felt helpless'". Para 28.71 states that DAC O'Loughlin's evidence was "hard to follow. His evidence struck me as an unsuccessful attempt to reconcile what he had heard by way of FSG information with his assertion that he had not realised that the fire had broken into the interior of the building, possibly extensively so." The fact that DAC O'Loughlin's evidence was hard to follow should not have been surprising. There is ample evidence of the frailty of recollections under normal (non-stressed) situations, never mind trying to recount such stressful events. Again, the Commissioner's evidence made this point very clearly. There are many reasons for what caused these difficulties. One example from academic evidence shows the "cognitive dissonance" experienced when an individual tries to make sense of an experience that conflicts with their own mental models when confronted by unprecedented experiences.

As well as having problems with exact recall, firefighters are not trained in the reflexive thinking necessary to understand why they did what they did on the night. It takes highly skilled investigators and researcher to coax this from such practitioners. We therefore need to question whether the adversarial process provides an effective approach to this problem.

The decision to revoke the stay put advice, as a better strategy to keep the residents safe, depended on the collection, collation and analysis of a large amount of contradictory data. Only in hindsight is it clearer as to the priority that might have been given to revoke. An example of this type of analysis can be found in the work done by Dunbar and Garud into the loss of NASA Shuttle Columbia. It was not that NASA was unaware of the problem with the heat resistant tiles, it was that the tile issue was but one of 4,222 issues that had been classified as critical (Dunbar and Garud, 2005:209[47]). Therefore, we need to look more closely at the LFB decision support system on the night in question to start to appreciate what the incident commander was thinking about.

- **“Decision Support System”**

An immediate concern when examining LFB communication policy is the idea of ‘a free flow of information between the control room and the incident commander’ (Para 33.14.) While this might be seen as a solution 'in a *perfect world*', it brings with it the problem of mental overload. For decades researchers have been positing the limitations of human mental capacity. In 1956 Miller suggested that the human mind can only process seven ideas (plus or minus 2) at any one time: this has become known as the 'magical number seven'[48]. More recently Chater (2018[49]) argued that the number might actually be one. This is consistent with work by Gigerenzer (2003:150[50]) on 'one-reason decision making'. Then, to add to this mix, there is the work on the effect of stress on perception and the decision-making process (for example see Murray, 2018[51]). One example illustrating this point can be taken from the Kerslake report (see paras 5.20 and 5.21). In this instance a single officer held both the posts of Police Gold Commander and the Duty Strategic Firearms Commander. The report concluded 'in reality the huge demands placed on each role by an incident of such magnitude as the Arena attack would have been a challenge for even the most experienced commanders.' In the case of Grenfell, Para 29.41 suggested that "if the number of FSG calls did exceed three or four, the LFB could deal with them properly" (inferring an actual capacity of 5 to 10) and so the unprecedented number (Para 29.4) they did receive at the

control room brought them to the *edge of chaos*. This body of work alerts us to the need to be very conscious of these limitations when trying to design highly reliable systems and to acknowledge the limited viability of multi-skilling. The Report did not do this.

From a *normal chaos* perspective, for the communication system to efficient, it needs to be examined as a single integrated decision support system to ensure overall it does not overload any single point in the system. This is clearly an issue for LFB as it is with many, if not all, high intensity operations.

In considering the recommendations set out in the Report, the picture that emerges is one where the whole operational communications *structure* of the service needs to be reengineered from the policy level downwards. It has to be noted that this includes policy produced external to LFB. The addition of three new data bases and 4 reviews means that anything else will lead to another suboptimal system prone to fail. Before any such project can be undertaken then other work is also required. First, the political funding body needs to decide how much change it is prepared to fund. Anything other than full funding would again lead to a suboptimal solution, Second, the scope of the system needs to be decided. For example, the system definition process needs to establish the design criteria. This may include, 1) How many FSG calls does the system need to be designed to handle considering at Lakanal house there were four (Para 28.21) and the average number being 15.4 a year (0.01% of all calls, see Para 8.6), 2) How many concurrent incidents is the LFB required to be able to handle, and 3) How much redundancy does the system need to have? Finally, an operational cost / benefits analysis decision needs to have been made on whether the up front and on-going costs will bring the benefits hoped for considering the actual reliability of the data when it is accessed for operational reasons. This work also needs to consider the high bureaucratic costs of maintaining the appropriate data quality for, if the data is not extremely reliable (c.99%), it would be dangerous to use it on operations without checking, at the time of use, that it is accurate. While in a *perfect world* these systems are desirable, the question is whether it would ever actually produce the operational benefits desired.

As with their failure to consider the potential for "cosmological episodes" due to the unprecedented nature of the fire, the Inquiry takes no account of the mental stress being faced by those involved. For example Para 29.55 states “The unprecedented volume of calls from people trapped inside the building placed enormous pressure on the control room, but in many cases that does not provide an excuse for these shortcomings, all of which involved significant departures from established policy in one way or another”; this is further evidence to support the assertion of the Inquiry team’s *perfect world* mindset. It does not take into account stress, fatigue, normal lapses, slips and misunderstandings caused by the volume and nature of their work (again see work by Reason (1998:303[52]) and (1997:71-73[53]) on these issues). While these factors might "not provide an excuse" (Para 29.55), they may provide a valid explanation.

For a further example we can look at Para 28.78 which concerns AC Roe's decision to revoke the stay put advice. The Report concludes the paragraph by saying "The strong terms in which he (AC Roe) expressed the need to change the advice (and the speed at which he did so on assuming command) strongly suggest that DAC O’Loughlin’s continued maintaining of the “stay put” advice, at least towards the end of his time in incident command, was incapable of being defended". The reports commented on the deficiency in command,

control and communications systems that did not work properly [recommendations 14, 15, 17, 18, 19, 21, 31 and 33] plus [recommendations 11, 12 and 13, that considered data management issues]. Here the report uses hindsight and textual analysis to come to a questionable conclusion:

- Firstly, there is clearly failure to appreciate the dynamics of the situation. AC Roe's position is not however as unequivocal as the report first suggests. The report also states in the same paragraph "when asked what advice the control room should then have given, he (AC Roe) gave a more qualified answer which recognised that some people might do better to remain in their flat". This shows alignment to DAC O'Loughlin's conflicted mental state.
- Secondly, there is clear academic evidence that, when stressed, decision-makers can be prone to “tunnel vision". While in hindsight it is often seen to be the cause of some failure, it can also be the reason a strategy succeeded. In these circumstances it is often characterised as "focused and driven". Whether the same phenomenon is seen as being focused or as tunnel vision often comes down to the story that the narrator wishes to tell.
- Thirdly, in terms of *normal chaos*, the issue concerns the situation's "*fitness landscape*"; that is how and when to move from one strategy to another with all the doubts and concerns that this brings. To see the need to change operational strategy requires vision and an open mind which is in direct conflict to the mindset required to deliver a given strategy. System designers should not ignore this dilemma as it needs further research in order to set a realistic baseline for future operations and recommendations.

There is another fundamental perception of communications that needs to be discussed. A common lay theory of communications is that you have to organise in order to communicate. This paper offers a different position based on one encapsulated in the construct of Communications Constitutes Organisation (COO): see Putnam and Nicotera (2009[54]). COO caters for the ad hoc and temporary decision support arrangements made as the command structure emerges during the course of an incident. A key feature of this approach is to recognise the communication needs of each party and how they may best be served so that they are able to fulfil their function. At a more detailed level, these needs can be separated into essential and desirable communications. This enables demand to be tailored to the capacities of the party to process the information received. This approach may help organisations to avoid the “sensory overload facing many of the decision makers on th(at) night.” (See McGuirk’s statement para 1.13 on page 2).

Questionable components of the "Stay Put" revocation analysis.

As stated above, the aim of this review was to try to learn as much as possible about how decisions were made so that the learning can be passed onto other fire and rescue services. To do this we need to examine the dynamics at work on the night. We need to examine the factors (*energy*) that drove the revoke decision and the factors (*energy*) that encouraged the maintenance of the status quo (the stay put policy).

One of the central messages of the Report is, and here it is paraphrased, that if the LFB had done 'a better job' (followed procedures exactly) then more people would have been saved.

However, the report offers no evidence for this supposition; it is just speculation. In fact, the report says on a number of occasions that it is not clear whether one misstep or another made any difference overall (see Paras 29.162, 30.51, 30.53). There is clearly an alternative proposition that needs to be considered. This is that the LFB was at maximum capacity to rescue residents and therefore, if LFB had done things differently, it would only have led to different people being saved. The question also needs to be raised about how to interpret the meaning of 'significant' when it comes to the number of people saved. From the point of view of the victim's families, it is understandable that any one life saved would be significant. However regrettably this cannot be a criterion for any system redesign as whether an individual lives or dies in such circumstance as this often comes down to a concatenation of events (more commonly referred to as luck (See Smith, 2012[55]). Examples of luck that night abound. The first is bad luck that the firefighter did not have a fob for the front door, but the good luck is that a resident of Flat 105 was there with one (Para 10.31). Para 28.38 states that "The element of chance (luck) could, therefore, not be wholly eliminated by using the control room to communicate with callers. There was bad luck that both the main control room and the helicopters were out of service for maintenance. There was good luck for the Commissioner, taken from her evidence, who was nearly killed by falling debris when visiting the firefighters at the base of the tower. Finally, many professional observers have remarked how lucky LFB was not to lose a firefighter that night. The role of luck (unplanned or unplannable coincidences, for good or bad) is seen as being a major uncontrollable dynamic within *normal chaos*.

Some of the reasons identified for the FSG interventions failing (taken from the Commissioner's evidence) can also be seen in terms of luck. The firefighters dispatched to save one set of residents encountered other residents and helped them to safety: this was good luck for one group and bad luck for the other. It must also be recognised that this will have created a dilemma for the firefighters: do they rescue the person in front of them or do they press on to their set objective. This raises another issue; should such dilemmas (decisions) be taken by the individual firefighter (as per HRO thinking) or by the incident commander (*perfect world* thinking)? The advantages and disadvantages of each option need to be debated with great care but, while this debate is outside the scope of this paper, it must be had if we are to learn from these events.

As part of this debate it must be recognised that this reality would be difficult for the families involved to accept; this is clearly a catalyst for them having *cognitive dissonance*. This is because such a reality would add the *energy* of *survivor's guilt* to their existing burden of grief. The issue here for any social group is how they might recognise these emotions (*energy*) and how they might help the victims come to terms with them (establish some form of *dissipating structures* whatever that might look like.)

If the assertion that a much larger number of residents could have been saved is flawed, then it maintains an *illusion* that in the event of tower evacuation (due to the failure of compartmentation) an unrealistic number of residents could be saved. Each fire and rescue service (even if this is only in the mind of their commissioner or equivalent) will have, at the back of their mind, an estimate of the number of casualties that will occur during an evacuation. The higher the number of expected casualties then the greater the force (*energy*) will be to maintain the stay put condition. Again, in her evidence, the Commissioner spoke of the casualties that have occurred since Grenfell by people self-

evacuating, however the questioner did not follow up this line of questioning. This suggests that wide ranging research is required in order to develop a strong empirical basis for these estimates.

This consideration also raises the issue of systems thinking in safety. If evacuation can be so dangerous, how might the need for evacuation be avoided. Here we might use what is referred to as the *Swiss Cheese* model (for example, as used by Haddon-Cave[56] in his inquiry into the factors that led to the crash of an RAF Nimrod aircraft in 2006). Here we see the system as having lines of flawed protection; the idea being that several of these lines need to fail for the incident to occur. In the case of the Grenfell fire, amongst others, the layers of defence included 1) the propensities of white goods to catch fire, 2) the original design of the building to ensure compartmentation, 3) building regulations to ensure redesigns of buildings are safe, and 4) the duty of building owners and managers to ensure the building remains safe throughout its working life. This question then becomes is it fair for the fire and rescue service to approach a fire in a high-rise building with the assumption that other people will have done their part in the system and therefore they can assume that compartmentation will last for 30 to 60 minutes and to plan their approach accordingly. If this assumption is judged to be unreasonable then the whole building safety system will have to be redesigned.

Given the assumption of containment, the LFB were on the back foot from the start. To see this, it is important to reconstruct the decision timeline. One of the major issues of contention is that the Report does not, again common to other reports examined, seem to take into account the time that the decision process takes. If, for ease of analysis, the decision process is broken down into "See, Appreciate, Act" (Lauder, 2011) then it is easier to appreciate how long these actions might take. A timeframe of 15 to 20 minutes might be more realistic but this proposition would need to be tested. This timeframe is in contrast to the Report that seems to see this whole process as being nearly instantaneous. This position is understandable but invalid as it comes from the hindsight bias that is prevalent within the *perfect world* paradigm.

Timescales are another key feature that need to be identified. The first of these is the "*30 Minute Window*" (See Lauder, 2015:104); this study identified that for operational crises or disasters, the time between everything seeming normal and being in a crisis was often less than 30 minutes. This leaves very little time for the organisation to adjust. The second timeframe to be considered is the "window of recovery" (Edmondson, 2005[57]). The third and final timescale is "hell hour"[x].

In the case of the Grenfell fire the "*30-minute window*" applies. In hindsight we can see that at 00.50 everything was normal. At 00.54 the fire was reported to LFB. The first firefighter reached the tower by 00.59. By 01.09 the fire has escaped the containment; in 20 minutes the normal routine of life had become the abnormal. The *recovery window* to stop the crisis had closed. A secondary *recovery window* was now in play. This second window would close when an orderly evacuation was no longer possible leaving rescue as the only option. The question therefore is, when was this point reached?

[x] "Hell Hour" is a label used by PM.be.

The Recovery Window is the time between the moment *weak signals* of a potential crisis start to emerge and the moment after which the crisis or disaster becomes inevitable; during this period it may be possible to avert the crisis if the right actions are taken. In the case of Grenfell, the second *recovery window* closed at the point at which it was no longer possible to conduct an orderly evacuation of the residents from the tower. After this point the *fitness landscape* had changed and now the LFB could only hope to achieve the rescue of as many residents as the situation (coupled with LFB's bravery and commitment) allowed. Despite the analysis provided by the Report, this moment is not at all clear.

Hell hour is an issue for every emergency or crisis. This is the label given to the period of ad hoc reorganisation (*self-organising*) that takes place at the start of crises when the temporary command and control arrangements coalesce according to the context. The target time given by PM to its clients is to have their crisis management system operational in one hour (hence the label). In terms of *normal chaos* this is seen as being a temporary *structure* driven by the *pattern* of activity. In the context of the Grenfell fire, Para 28.67 says "ordinarily, command decisions about how to tackle a substantial fire should not normally be made in the absence of an appropriate command and control structure, there will be rare occasions … when the urgency and threat to life is so great that decisions need to be made before such a structure has been established." Each time the fire service deploys, the incident commander establishes a temporary command structure as per his duties (see Para 7.46.d.) Many events to which fire and rescue services respond will only need a minimal structure that is well practised. In the case of Grenfell, the basic components of the structure were well understood, however the *scale* of events, the timeframe over which it developed and the number of assets needing control placed unusual demands on the incident commander. As the size of the response escalated there was a need for the incident commander to handover to more senior and more experienced commanders. This factor complicated the command arrangements. For the LFB *Hell Hour* at Grenfell lasted for over two hours until AC Roe established himself in the incident commander role. The problem of *hell hour* is well recognised and is universal; it has to do with the dynamic of the GOLD, SILVER, BRONZE command structure used by first responders. For a separate example see the report into the bombing at Manchester Arena in 2017 (Kerslake, 2018). One key question here is how much of the incident commander's time and attention would have been taken up by this issue. From the Report (Para 28.76) it would seem to have taken the whole of DAC O'Loughlin's attention. This leads to the question of what were successive incident commanders thinking about; what was absorbing their time and attention? What would not have happened had they not done what they did do? To understand whether it was fair to criticise or event critique them would require a much fuller study of the dynamics at play than the Report provides. This issue does not seem to have been addressed by the Grenfell Inquiry team; it is important because it is the difference between foresight and hindsight.

Let us now look at the stay put decision through the lens of the *30-minute window*, the r*ecovery window* and *hell hour*. In the context of learning from these events, the key discussion points are:

- At what level (floor) did the stairwell become impassable and at what time? Here we have a second order issue; is impassable to whom? The stairwell may have been

passable to LFB firefighters with protective gear but not to unprotected residents. This difference in timing was also not made clear.

- What was the length of time that the LFB would have needed to evacuate the residents? Here two timeframes need to be considered. The first would be for an orderly evacuation based on the optimal plan. The second is a disorderly evacuation where conflicts would arise between what was optimal for everyone and what was optimal for each individual. As some residents had started to self-evacuate, the timeframe for any evacuation would, in practice, likely be other than optimal. The time needed to evacuate was never discussed and so it is not possible to determine the point at which the decision to evacuate should have been made. By the time *SM Walton* had handed over incident command to *DAC Andrew O'Loughlin,* at 01.58, it is highly likely that the secondary *Recovery Window* (the option of an orderly evacuation) had already closed and, from then on, rescue was the only option open.

Para 28.28 states that "To evacuate a building of this kind in the face of an established 'stay put' policy would have required a cool head and a great amount of self-confidence". The person also needs time to think. The Report gives no assessment of whether the incident commander had the time to conduct the cold analysis needed to come to the conclusion that revoke was the best option. While in the *perfect world* he should have, in the chaotic world that faced him, this would seem unlikely. Having said that, to be definite would require a new assessment taking an approach very different to the one used by the Inquiry team.

Para 28.6 is clear "that, before AC Roe assumed command, none of the incident commanders had been able to conceive the possibility of mass compartmentation failure and the consequent need to consider, and then order, a total evacuation of the building.". The dynamics of this were never examined and so the Report fails to help us learn why this happened. The paragraph then goes on "There came a point when it **was, or should have been**, reasonably obvious that operational responses to individual FSG calls were, or were likely to be, ineffective" [*emphasis added*]; this would seem to suggest that there was a point at which responding to FSG calls should have been abandoned in favour of evacuation. It is not clear from the Report when the Inquiry team thought that moment occurred. The suggestion that FSG strategy should have been abandoned in favour of evacuation means that the strategy (*fitness landscape*) was the choice from three options. These options being (1) FSG response, (2) evacuation, and (3) rescue. From a learning perspective, it is therefore difficult to understand the value of the Report pointing out all the detailed problems with an FSG response strategy which they suggest should have been abandoned very early on: why should LFB spend effort and resources on trying to perfect an inappropriate response? We know that of the 17 FSG rescue attempts only 3 were wholly successful (Para 28.106). While we have some reasons for individual sorties failing, the Report does not provide a systematic analysis of the failure. The Report suggests that it was down to communications failures. However, this does not explain the 12 failed rescues. While we can speculate that if the communications had been perfect and more FSG rescues were initiated, the high failure rate of the ones that were actually launched suggest many of these would also have failed. Surely a more appropriate topic for discussion and debate is when (in what circumstances) should an FSG response be abandoned for another strategy? Even by 01.28 residents were calling saying that they were "stuck and did not know how to get out" because of smoke in the lobby (Para 10.100) and, by 01.40, the stairwells (Para 11.42). By 01.38 residents were

being found who were unable to help themselves (Para 10.101). These issues coupled with the lack of a general way of communicating with the residents in their flats (Para 28.33) would point to any evacuation strategy being difficult to execute by 01.40. Therefore, the question must be raised as to whether the recovery window for an orderly evacuation had, by this time, already closed. Without a systematic analysis of this system failure, it is difficult to learn from these events. While the Inquiry team may have gathered the data necessary to conduct this analysis that must now be the subject of a separate piece of research.

Para 28.6 also states that "the stairs would remain passable for only a limited period of time"; again, it is not clear from the narrative when this moment occurred. Here we can use the idea of *edge of chaos* to debate when this moment was. There will be a moment after which passage will be impossible. However, prior to that there will be a time when passage is only possible with full fire-fighting equipment, before that there will be a period when support and aids (such as a smoke-hoods) would be needed, before that a period when people could pass with resulting harm injury (taking a degree of courage and determination) and then, early on a period when residents could have exited without any fear of harm. So when the report says “it was, or should have been, **obvious** that only a supervised mass evacuation would minimise the number of casualties" [*emphasis added*] it is not clear what this means. The paragraph does however say "That point had been reached by 01.30 at the earliest and by 01.50 at the latest." Here context is important: 1:30 is 10 minutes after the fire crew entered the kitchen where the focus of the incident commander was likely to be on extinguishing the fire in the kitchen (his original task). Let us examine these critical timings further.

The Report states (Para 10.78) that by 01.30 WM O’Keeffe had considered mass evacuation and had discussed a strategy for multiple rescues with WM Dowden. Para 28.18 states "I doubt that there was a sufficient number of firefighters at the scene by 01.30 to have allowed a safe and efficient assisted evacuation of all of the tower’s occupants”. So, after approximately 30 minutes from the time the first units of LFB arrived on the scene, they did not have enough assets to start a safe evacuation. Para 28.37 seems to suggest that the decision to evacuate should have been made by 01.50. However, while Para 28.41 states that WM Dowden ‘should (at that point) have sent as many crews as were reasonably available into the tower to knock on doors’ Para 28.42 states that "this strategy might have exposed firefighters (very few of whom had EDBA [Extended Duration Breathing Apparatus] by 01.50) to serious danger higher up in the building’. The Report also notes at Para 28.129 that “All BA [Breathing Apparatus] wearers encountered difficulties of various kinds within the tower and it cannot be said with any confidence that greater use of EDBA would have resulted in a larger number of successful rescues”. So, at 01:50 the incident commander still did not have assets to safely evacuate the building and even if he had it is doubtful whether this would have made a difference: this has to be seen as a strong dynamic against revoking. If we are to learn from these events then further research is required that models attempts to evacuate the building at key points in the timeline. This research, based on what is known about human behaviour in these circumstances, would help draw out and make explicit the assumptions necessary to build such a model. In turn this would help fire and rescue services to develop their understanding of the dynamics of such situations.

When considering whether to revoke 'stay put', there is another factor (dynamic) to be considered. The incident commander had to balance his duty to the residents and his duty

of care to his fire-fighters. During this period the incident commander had seen, appreciated and acted upon the information suggesting that the fire was escalating quickly. He had called for more resources to be deployed to the site. We can see from the evidence that a lot was happening; the incident commander had a lot to see, appreciate and act upon. Superimposed on this workload was the decision whether to revoke the stay put policy. Within the blizzard of information assaulting this individual there were *weak signals* pointing to the need to revoke the stay put decision but, as is often the case, *weak signals* are often missed. No solution has yet been found to this problem. While, in hindsight, revoke was a critical consideration, at the time it is not surprising that its significance was missed. Other factors were also at play.

While Para 28.32 acknowledges the 'difficulties' and 'risk to life' posed by the decision to evacuate, it does appear to underplay those difficulties. The Report stated that the 'obstacles do not mean that a complete evacuation of the tower was impossible'. Here we have an issue of *scale* in the narrative. The way the passage is written could, at its most optimistic, be interpreted as the whole tower (the tower as a single entity) was not impossible, therefore possible, to evacuate; this raises the idea that loved ones could have been saved and therefore would have added *energy* to the victim groups' grief. If this is false it would have been an unintentionally cruel thing to suggest and it does raise the question about who benefits from such an approach. At the other end of the *scale*, at the most pessimistic, it could be interpreted as some (a few additional) individuals might overcome the difficulties and escape the tower. As stated above, this would have been mostly an issue of luck. This Report text has the potential to mislead the reader as to the dynamic complexity of the revoke decision. For the incident commander would have been aware that his decision to revoke stay put was likely to lead to the death of a considerable number (tens?) of residents. When facing this life or death decision, it is understandable that he reverts to his training of "trust the system / trust the process". Often in life threatening situations, workers are required to carry out actions that are counter intuitive (for example when fire-fighters at Mann Gulch had to set fire to the terrain in order to avoid the fire that engulfed many of them). When stressed and at the edge of their own mental chaos (being in danger of having a *cosmological episode*), experience has shown the advantage of trusting the process. It has to be accepted that this will also have downsides. This may have been the case at Grenfell when it might have been better for the residents to question the process. However, the fundamental question here is, what is the balance of advantage overall in questioning the process? Experience would suggest this may be to the disadvantage of the community overall, however more evidence is required before making such a fundamental change.

Summary

The problem of organisations failing to learn from past experience is not new. Toft and Reynolds, (2005:27-28[58]) examined this issue which they labelled "failure of hindsight". As they discuss, the reasons can be complex. While the desire and need to learn from such events is clear, there must be an issue over whether the inquiry process is, in itself, just another error inducing system. The inquiry approach to learning is overwhelmingly bureaucratic. It is about rules and ensuring compliance. There is a clear question as to whether this approach is doomed to fail because it will never understand the dynamics that created the situation in the first place. In Para 30.50 the Report accepts that "it would be

unrealistic to expect complete compliance with each and every aspect of the Joint Doctrine" and yet they have done just that. Para 30.50 also says that "it is precisely for Major Incidents such as the fire at Grenfell Tower that the Joint Doctrine was designed" without questioning whether that document, together with the related procedure manual and protocol were fit for purpose. The fact that so many similar documents fail to help us learn must give pause for thought as to whether the reliance on compliance as a strategy is an unrealistic one and whether an alternative approach is needed.

Charles Perrow warns that complex systems are prone to fail yet we insist on producing ever more complex systems (see the section on the cladding; also see Paras 28.135, 30.9 and 30.115 for example) and then are surprised when they fail. In response to complex systems we grow complex response systems and are again surprised when they fail. It is important to remember that even advocates of HROs recognise that these can also fail. In the case of LFB, we see a plethora of well-intended documents that, when tested, were seen to be fantasies as recognised in Para 30.18. Knowing how the system works and what is actually important is necessary to avoid just moving from Type 1 to Type 2 failures.

The inquiry process is not conducive to learning. It is intimidating and patronising when compared with the aircrash investigation system. At several points the report commented that those questioned by the Inquiry were unable to explain why something was or was not done. This should not be unexpected for three reasons. The first is the adversarial nature of the questioning making witnesses defensive. The second is that the witnesses had not been trained in reflexive thinking. Finally, the process does not take into account the capacity of individuals to perform and then recall complex actions when under stress.

Finally, the inquiry process completely separates the recommendations from the reality of funding them. For organisations, such the fire and rescue services, resources will always be limited. UK Government budgeting rules mean that all expenditure is committed to previously justified outputs. Therefore, unless new funding is allocated, any enhancement to one area will require funds being removed from another area thereby leaving gaps or vulnerabilities. The reality often is that the organisation's response adds more bureaucracy than capability, which in turn, leads to the potential of a Type 2 error. In government agencies this just means a greater disparity between funding and deliverable capability (in other words, greater inefficiency).

In the Report the link between the findings and the recommendations (and their resource implications) are often tenuous. Para 27.33 states that "there is no reliable evidence to suggest that the inaccurate and incomplete information materially hindered the firefighting and rescue efforts". Para 28.112 states that it "is not possible to say whether the failure to ensure attendance by additional EDBA crews at an earlier time had any direct effect on the number of casualties." The sentiment that there is no evidence that a departure from the doctrine or plans caused or contributed to the death or injury can also be seen in Paras 29.162, 30.51, 30.53. This begs the question as to which failures are actually important and therefore should be a priority to fix.

In the Report we see a clash of world views. We have a legal rules-based world view, which has time to deliberate, examining a complex fast-moving world where pragmatism is judged by real world consequences. There is therefore a danger that the team making the

recommendations did not really understand the problems they described. The evidence for this statement is in the number of times the team's analysis is undermined by the work of others who have spent their lifetime trying to understand these issues. It should be noted that this paper only offers examples to illustrate this point. It would have taken a much longer paper to forensically dissect the Report to little added value.

The Report stated that it would be evidence based. However, the only evidence provided is of what did not go well. No evidence was provided that the proposed recommendations will have the effect desired and will not generate unintended consequences. This is a major concern.

One of the Report's major failures is its understanding of *scale* as has been highlighted. This failure is made plain in Para 28.10 that states ”It would be impracticable to identify and analyse the causes of each and every failure of action and error of judgement in responding to a mass emergency involving hundreds of officers over a seven-hour period. Instead, one must stand back and examine the LFB’s operational response from a broader perspective". This makes it clear that the Inquiry team were focusing on the organisational (macro) level. If the report was to do this consistently then it would not have passed judgement on the actions of individual officers. It would have restricted its comments to the ones made at Para 2.26 which are seen to be both valid and useful. However, as the aviation industry has shown within their aircraft accident investigation, in order to learn it is necessary to investigate the dynamics at the appropriate *scale*. In this case, it is the dynamics at the individual (micro) level that need to be examined if society is to learn from these dreadful events. A broad-brush approach only creates the *illusion* of learning.

Finally, we have to question as to what the benefit is, and to whom, of raising false hope that all (or more) of the victim groups' loved ones could have been saved. Whether an individual survives such events can often come down to an issue of luck and it is this randomness (the perceived unfairness) that can be hardest for the survivors to face. Might it not be better for society for the LFB to acknowledge what they could have done better but to educate the public to realise that this may not always be possible. This is a subject worthy of future research.

Limitations

This paper is written by a specialist in organisational failure where the focus has been on the needs of fire-fighters to learn from this case. While this paper is written by a British researcher looking at the British system, and it acknowledges that there are differences with how these issues are handled in different countries and jurisdictions, it is the result of discussions with the commander of a non-British fire and rescue organisation. It is acknowledged that the implications for each national system will need to be examined on a case by case basis. The paper simply identifies and illustrates the key issues for learning from such reports; it demonstrates that an alternative analytical paradigm exists. While the researcher did not attend the inquiry or have discussions with the Inquiry team, this would be the same for all other fire and rescue services trying to learn from this case; this limitation is therefore not considered to diminish the relevance of the arguments put

forward. This paper offered only one alternative perspective (that being *normal chaos*) which is seen to offer practitioners a more valuable way of achieving learnings and insights after an unwanted event. As the main point of the paper is to make people question the use of the more commonly used *perfect world* paradigm, one alternative was seen as being enough to make this case. This subject, and its implications, now need to be opened up to a wider audience where it might be used to set the scene for future multi-disciplinary debate and research.

Conclusion

As human populations move to more and more high rise living, the questions raised by the Grenfell fire become an important topic for research. This research might even offer those affected another *dissipating structure* for their grief.

There can be no doubt that fire-services throughout the world want to do their best for the community they serve and it is a real tragedy when a community is beset by an event such as the one that occurred at Grenfell on the night of 14 Jun 2017. The desire to learn is paramount amongst fire-fighters. If this was an easy process the fire-service would have perfected it by now. It is not easy and so they must continue their efforts. An important part of this process is the inquiry process.

The report produced by Moore-Bick into the events on the night of the fire is probably (within an acceptable margin of error) an accurate narrative of those events. The data they collected overall is likely to provide data for a wide range of future research. The value of this Inquiry is that it recognised the need to let the victims be heard as this process helps them to understand what happened on the night and so might set them on the path of coming to terms with their loss. Where this paper diverges from the findings of that report is in its analysis of the events and the recommendations produced.

Recommendation 33.12 raises concerns over the Inquiry team's expectations. The Report states: "**It should be a simple matter** for the owners or managers of high-rise buildings to provide their local fire and rescue services with current versions of such plans" [*emphasis added*]. In itself, as a single action, the Report is right that such an action should be relatively simple. However, it is a mistake to see any single action as an isolated event. Every action takes place within a context. The context adds complexity and complexity adds dilemmas (often in the form of conflicting priorities). In short, no action should be seen as being "a simple matter": every action needs to be seen as being part of a chain of events that interact with other such chains. This consideration of the natural complexity of every event has led the Antwerp Fire Service to adopt the logic of *normal chaos* rather than the more prevalent paradigm that has been labelled the *perfect world* paradigm. This is a clear divergence in perspectives between the Inquiry Report and this paper.

The reason for this divergence is the different paradigms used. The *perfect world* paradigm used by the Inquiry team is, at its simplest, looking towards having a perfect system and this worldview predominates management thinking. From studying the pertinent academic literature on organisational failure, it is reasonable to draw the opinion that such perfect systems are fantasies (*illusions*). They are impossible to produce and equally impossible to operate perfectly. An alternative paradigm is therefore required.

This paper offers an alternative *normal chaos* paradigm through which to examine these issues. This paradigm centres around the complexity of everyday interactions. It also focuses on the limited human ability and capacity to make sense of their world and then to act in the most appropriate manner. *Normal chaos* emphasises non-linearity in contrast to the linearity of the *perfect world* paradigm. *Normal chaos* recognises that systems will never be perfect and that humans are prone to slips, lapses and errors, and that misjudgements and mistakes are an unavoidable part of everyday life. The question that is at the heart of the *normal chaos* paradigm is, how can we best cope in such circumstances? To this end, *normal chaos* research looks to the work being undertaken to develop robust and resilient systems as being the way forward.

There is one unintended irony that runs throughout the course of the Report. This is the criticism of LFB for its "failure to learn". It is clear that those conducting the Inquiry have not learnt either from academics who have researched the issues they raise or from the conduct of other such inquiries. Their approach is embedded in their everyday practice as opposed to acquiring the specific skills and knowledge needed to learn from such events. There is clear evidence that this Inquiry fell prey to the dangers of their own educated bias, the dangers of a blame culture, the dangers of a rule-based approach, the danger of moving from Type 1 to Type 2 failures. They also conflated fault finding with learning. None of the faults identified in this report was new to subject matter experts. The problem for society is that neither academic nor practitioners have not yet found ways to fix these problems.

In order to enhance the learning from the activities of the emergency services in the long term, the international body of firefighters should:

> consider developing an accident investigation body (modelled on the aircraft industry) to learn from the body of experience from all major incidents and to develop robust procedures to improve the way they are handled in the future,
>
> investigate the adoption and development of *normal chaos* as their central analytical paradigm.
>
> lobby government to enhance the learning process by separating the finding of facts and liabilities from making recommendations on how the system may be improved. These findings of facts would be limited to identifying areas of weakness as Moore-Bick did at Para 2.16.

Future Research

In the short-term it is important, as a first step to achieving this goal, to recognise there is a need to conduct some basic research in order to set a baseline for the development of this approach. This requires a research strategy to be developed. Topics that should be examined would start with:

- Endorsing Moyra Samuels' (Justice4Grenfell)[xi] call for "proper research" into cases where stay put does not work, research needs to examine this initial assumption held

[xi] Interview on ITV, Good Morning Britain", 30 Oct 19

by fire-fighters (such as compartmentation hold of up to 60 mins) and the *weak signals* indicating a loss of compartmentation and strategies for both evacuation and rescue. The study needs to include a "force field analysis" (based on consideration of "*energy*") between the factors promoting "stay put" and those leading to revoke.

- Reengineering Communications for Firefighters (not necessarily "firefighting") and multi-disciplinary (police, fire, ambulance) Operations based on their *interdependencies*.
- The role of initiative in firefighting operations.
- The effects of stress on sensemaking and decision making.
- Ways to manage large *scale* public grief.

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