

Learning from UK disaster exercises: policy implications for effective emergency preparedness

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With a view towards suggesting improvements to the official UK Guidance for disaster exercises, this paper critically examines a representative sample of recent disaster management exercises in the United Kingdom to determine how they are planned, conducted and assessed. Personal observations and in-depth qualitative interviews were used to study three representative multi-agency disaster exercises in the UK: (1) the Hitachi 395 Evacuation Workshop and Exercise Twin Bore, (2) Exercise Saxon Shore and (3) Exercise Operation Safe Return. The research demonstrates that disaster exercises in the UK generally consist of four main approaches: (1) disaster response and adaptability, (2) building-block approach, (3) citizen participation and (4) discussion-based debriefs. While the data demonstrates that each of these approaches has significant merit, it also elucidates key improvements that should be made to the official UK guidance and reflected in future exercises. In particular, the research suggests that the Guidance should highlight the importance of adaptability at the scene of a disaster, advance a building-block methodology to organising exercises and reiterate the need for better debriefings of volunteer participants.

Keywords: adaptability, building-block approach, citizen participation, debrief, disaster exercise, emergency preparedness

Introduction

In major incidents, emergency services are required to work together to minimise the consequences of disasters, as no single agency can possess all the skills and resources necessary. For this reason, the United Kingdom's emergency services and local authorities are obliged to cooperate and share information with other responders engaged under the Civil Contingencies Act 2004 (Walker and Broderick, 2006). Yet the key to collaborative success in response activity lies not in the response phase itself, but rather in the preparation stage (Scholtens, 2008). Disaster exercises are an integral part of the emergency preparedness and, thus, effective preparedness for emergency needs to be supported by multi-agency training exercises from all the organisations concerned.

Multi-agency exercises in which participants from different agencies observe and review each other's training exercises can enable emergency responding agencies to not only understand each other's procedures, but also identify potential communication and coordination problems when a disaster strikes (Flin, 1996). Hence, multi-agency disaster exercises are currently employed as an effective training tool for cooperation and information-sharing within the British emergency services (Cabinet Office, 2011; Upton, 2007).

Although the current official UK Guidance, 'Emergency Preparedness', issued by the Civil Contingencies Secretariat, requires these inter-agency exercises to take place, it does not provide specific standards or guidelines for conducting such exercises (Walker and Broderick, 2006). The Guidance consists of ten short sections: (1) the purpose of exercises, (2) plan exercising, (3) plan testing, (4) exercise design, (5) exercise types, (6) preparations for an exercise, (7) exercise documentation, (8) debrief and evaluation, (9) lessons identified and lesson learning, and (10) generation of future exercises (Cabinet Office, 2011, pp. 50–63). However, there are no detailed explanations or instructions regarding how to design and implement disaster exercises and what practical skills and abilities should be improved by exercises for better disaster response.

This research attempts to fill that gap. First, it examines how three recent and representative live disaster exercises have been organised and conducted in the UK. To achieve this aim, an extensive literature review on disaster exercises has been conducted to examine critically current practice in the UK. However, instead of having a separate literature review section, the related scholarship on disaster exercises has been integrated and addressed as appropriate within the section of the paper detailing the research findings and discussion. Second, this paper analyses the successes and failures of such activities through participant interviews. Third, it derives practical recommendations for more effective emergency preparation that should be reflected in the next edition of the Guidance.

Research methodology

The main purpose of this research was to examine critically the current practice of UK disaster exercises, based on an empirical examination of their successes and failures, and to offer policy suggestions for more effective disaster preparedness. The first part of the research involved selecting representative disaster exercises in the UK that allowed for analytical generalisation (Yin, 2003). A total of three recent disaster exercises in the UK were chosen because (1) they involved the active planning, participation and/or observation of multiple public agencies, and (2) due to their size and scope, these exercises allowed for the examination of multiple aspects of disaster response, including logistics, inter-agency communication and coordination, and physical capabilities. The following three exercises were selected and are described in detail below:

1. the Hitachi 395 Evacuation Workshop & Exercise Twin Bore;
2. Exercise Saxon Shore; and
3. Exercise Operation Safe Return.

To assess these exercises, it was necessary to employ research methodologies that were appropriate for candidly discovering how interactions occur and are perceived in real-life settings because the social and cultural contexts in which disaster exercises

take place are vital to understanding their effectiveness (Johnson, 1987; Royal Society, 1992). This led to the adoption of the following qualitative research methodologies: participant observation and qualitative interviews.

Participant observation was selected precisely because it is one of the most appropriate means for investigating the social and cultural contexts of the people, groups, organisations and settings under scrutiny (Robson, 2002). Accordingly, the author reviewed the available disaster management Guidance and plans for each exercise, and then personally observed each of the three disaster exercises, taking detailed notes of how the plans corresponded with the actual performance of the disaster management exercises.

Qualitative interviews of disaster exercise participants were also employed as a research methodology because they enable a researcher to investigate and understand the candid attitudes, beliefs and experiences of exercise participants through listening, hearing and sharing social experiences (Rubin and Rubin, 2005). In disaster management exercises, in which the critique of a disaster response plan might effectively mean the critique of a superior officer, it was particularly important to have the flexibility required to elicit voluntary and unexpected information from potential interviewees. Accordingly, this research made extensive use of unstructured qualitative interviews that were centred on a list of key topics rather than pre-formed and potentially leading questions (Loftland, 1971). Those topical areas were as follows: (1) selection of disaster exercises and scenarios, (2) goals and objectives of exercises, (3) organising and conducting emergency exercises, (4) how to deal with uncertainties of real situations through disaster exercises, (5) resemblance to actual disaster response, or simulating actual disaster responses, (6) debriefing sessions, and (7) changes to 'after-action' practices.

In total, 26 disaster exercise participants were interviewed in connection with the three exercises: 6 participants of Exercise Twin Bore; 12 participants of Exercise Saxon Shore; and 8 participants of Exercise Operation Safe Return. Interviews were conducted before, during and after each exercise. To obtain a diverse and representative sample of responses, the interviewees included police officers, fire fighters, health workers, railway staff members and underground staff members wherever possible, although it was not possible to locate a subject from each category for each of the three exercises. By virtue of this experience-based criterion, representative interviewees were carefully selected and thus, qualitative interviews could also acquire analytical generalisation. For the purpose of obtaining realistic opinions of average people regarding disaster exercises, the study also includes interviews with five citizen volunteers.

Overview of the disaster exercises observed

Hitachi 395 Evacuation Workshop and Exercise Twin Bore

In December 2009, Hitachi 395 trains, the UK's first high-speed trains, were supposed to be inaugurated on the new high-speed 1 line between Ashford International, Kent, and St. Pancras International, London (BBC News, 2009). For this, the Hitachi 395 trains should pass through the newly built tunnels: London Tunnel 2 and the

Thames Tunnel. An accident in such a tunnel could cause significant damage and, accordingly, a discussion workshop was established to develop an awareness of evacuation issues in the two tunnels as the first part of the preparations for the introduction of the high-speed trains. The evacuation workshop was planned by Southeastern, which provides train services in London, Kent and East Sussex, in partnership with emergency services in London, Kent and Essex.

The Hitachi 395 Evacuation Workshop was conducted in London on 30 March 2009, to ensure that evacuations in the tunnels could be effectively managed and that efficient coordination arrangements were in place between the key responders. The discussion workshop involved brainstorming potential issues, focusing on the following four scenarios: (1) non-emergency passenger transfer, (2) emergency passenger evacuation with evacuation trains, (3) emergency passenger evacuation with no immediate evacuation trains, and (4) serious incident with passenger self-evacuation.

Following the workshop programme, Exercise Twin Bore took place in the railway tunnels in order to fully test the emergency train evacuation issues in a live action environment on the night of 24–25 April 2009. Specifically, Exercise Twin Bore aimed to test and validate (interagency and interjurisdictional) agreements, consensus and procedures in a real-life setting, which had been developed and discussed at the Hitachi 395 Evacuation Workshop. The exercise started at St. Pancras at 22:15 on Friday, 24 April 2009 and ended around 2:30 a.m. on the next day at the same station.

Exercise Saxon Shore

Exercise Saxon Shore was a live multi-agency counterterrorism exercise that was carried out on Friday, 26 June 2009 in Dover, Kent. As part of the Home Office National Counter Terrorist Exercise Programme (HPA, 2009), South East Coast emergency services designed Exercise Saxon Shore in partnership with governmental departments, hospitals and local health care organisations, with the aim of testing the emergency responses to and management of a terrorist attack.

The exercise was led by the Kent Constabulary in conjunction with the Health Protection Agency and was funded and coordinated by the Home Office and the Department of Health at a central government level. In particular, there was a structured training programme building up to the exercise for the participants, which included forensic awareness, Hazardous Area Response Team training, command training days and table-top exercises.

The live exercise itself consisted of responding to a hypothetical terrorist attack scenario in which suicide bombers detonated a radioactive dirty bomb inside a minibus at a college car park, resulting in 300 contaminated casualties requiring rapid decontamination and treatment (MTW, 2009). In this scenario, Exercise Saxon Shore aimed at practising the implementation of multi-agency counterterrorist contingency plans when an attack occurred in their locality. The exercise involved all of Kent's emergency services (up to 1,000 people including police, paramedics and firefighters) and approximately 150 additional volunteers. The exercise demanded meticulously detailed preparation, and it took nearly 12 months to plan.

Exercise Operation Safe Return

Exercise Operation Safe Return was a five-day counterterrorism exercise planned and led by the British Transport Police (BTP), England. The exercise occurred on the London Overground route between Camden Road and Kentish Town West railway stations from Monday to Friday, 15–19 March 2010. It was primarily geared towards refreshing as well as practising BTP's counterterrorism procedures and techniques in the event of a severe bomb threat requiring evacuation of commuters. In particular, the exercise was regarded as a window of opportunity for police officers not only to practise what they had learned in class regarding counterterrorism contingency plans, but also to renew their search and rescue skills.

Exercise Operation Safe Return included more than 100 police officers from BTP Counter Terrorism Special Units, including explosive search dog handlers. To create a degree of realism, dummy explosive devices were placed along the route, so the search teams with sniffer dogs could search for and discover the dummy explosives. Several members of staff from London Overground, London Underground and London Fire Brigade (LFB) also attended and observed the exercise. Moreover, those participants were provided with staff training and exercises on the management of counterterrorism incidents, in which they learned about dealing with suspect packages, methods employed by terrorists and what they should do if they discovered suspicious items. Several police officers from other local police forces, such as West Yorkshire Police, attended and observed the exercise as well.

Findings and discussion

Disaster response and adaptability

The Emergency Preparedness Manual states that disaster response and management exercises have three main purposes: testing, training and validating (Cabinet Office, 2011). The Guidance Manual suggests that one major purpose of disaster exercises is to test and validate existing response plans, and this was indeed the intended purpose of the three exercises examined in this study. Both planners and participants seemed keenly interested in confirming the suitability of their existing response plans and potentially revising them if need be. For example, the purpose of Exercise Twin Bore was to test train evacuations and to validate the agreements and procedures between responders. Exercise Saxon Shore was primarily geared towards testing the emergency responses to and management of a chemical, biological, radiological and nuclear terrorist attack. Similarly, Exercise Operation Safe Return aimed to test the emergency responses to a terrorist attack as well as the BTP's counterterrorism contingency plans.

However, the UK's current method of conducting exercises, which simply emphasises the testing, application and validation of existing plans and procedures, might not be sufficient to deal with unexpected emergency circumstances (Ford and Schmidt, 2000; Borodzicz, 2005; Wybo, 2008). This is because adaptation is essential in managing

the situational uncertainties of real incidents, and responders sometimes need to work outside the rules, regardless of standard operating procedures. Indeed, participants in Exercise Operation Safe Return stated the following in their post-exercise interviews:

- We follow the routines, but not rigidly [. . .]. We have to develop, you know, change the way you search.
- We have to adapt. A manual doesn't say what to do for every situation. A manual is just guidance. Sometimes, we have to stay outside the routine rules, regardless of the manual.
- Yes, we change the rules. In theory, you will drill at a 90-degree angle, but sometimes you can't do it. You have to adapt [. . .]. may not be in the manual, but it works.
- We also need to adapt to rapidly changing circumstances [. . .]. Sometimes, rules can get in the way [. . .]. There needs to be a degree of flexibility. Things are rarely black and white. There is room for a grey area.
- Sometimes, we won't go A, B, C, D. We could go A, D, H, okay? That's what suits that situation at a particular time [. . .]. Depending on the layout, capacity and size, adaptation is the key.

These comments indicate that the interviewees recognise the importance of adaptability and they are utilising it at the scene of a serious accident. The need to prepare for the unexpected can be explained by Turner's six-staged organisational disaster development model (Turner, 1978). According to Turner, the fourth stage is the onset of a disaster, which consists of ill-structured scenarios that do not respect the organisation's existing assumption and perspectives as to what constitutes risks or hazards. The fifth stage is the rescue and salvage operation, but normal or conventional modes of rescue and salvage operations can rather aggravate the situation, notably because of the ill-structured scenarios. In this regard, Turner argues that 'flexibility (adaptability)' should be allowed during the rescue and salvage operation.

Similarly, Kendra and Wachtendorf (2003) argue that flexibility is one of the fundamental abilities needed, especially when unforeseen problems occur or established methods begin to fail in disaster response. Thus, disaster exercises also need to encourage a degree of flexibility, as it may be the key to launching an effective response to unpredictable events during an emergency. The importance of adaptation and flexibility should be reflected in the UK Guidance.

Building-block approach

In the UK, emergency exercises are usually undertaken in three types: discussion-based, table-top and live exercises. The choice of which type of exercise is most appropriate depends on what exercise planners are hoping to accomplish by conducting the exercise (Cabinet Office, 2011). In particular, discussion-based exercises are best when the goal is to develop individual and organisational awareness about disaster procedures and response plans in a cost-effective way. Table-top exercises are best

when the goal is to test verbally procedures and plans by developing a scenario. Live exercises are best when the goal is to test fully all of the aspects of disaster response, including logistics, inter-agency communication and coordination, and physical capabilities.

However, it is normally effective to develop the types of exercises progressively from discussion-based (or workshop) to live exercises. In this sense, Overy (1993) proposes the model of a progressive build-up in selecting the type of exercise, arguing that it is effective to progress readily from the simplest type of exercise to more complicated ones. In a similar vein, Perry (2004) argues that a discussion-based exercise—the least complex type—is noticeably beneficial when a brand-new protocol is first introduced into the existing response systems.

The Home Office, which previously had overall control of emergency planning and response at a central government level (now under the Civil Contingencies Secretariat within Cabinet Office), stipulates in the *Exercise Planners Guide* that a live exercise should be conducted after the exercise planner gains confidence in the abilities of those involved through sufficient training in discussion-based or table-top exercises (Home Office, 1998). However, the current Guidance offered by the Civil Contingencies Secretariat omits this important point; it should thus be updated and clearly cross-referenced with the relevant section of the Home Office's guide.

Careful observations of the disaster exercises prove that simple types of exercises, such as discussion-based or table-top exercises, are employed as a rule prior to a large-scale live exercise. For example, the Hitachi 395 Evacuation Workshop, a discussion-based exercise, had been organised to address the evacuation issues by way of verbally responding to the four possible scenarios. Then, following the workshop, Exercise Twin Bore was held to fully test the train evacuation issues in a real-life environment, which had already been discussed in the workshop. Similarly, Exercise Saxon Shore was part of the Home Office National Counter Terrorism Exercise Programme, which also comprised a combination of table-top and live exercise sessions. Likewise, Exercise Operation Safe Return formed part of an ongoing explosive ordinance disposal search programme of training, skill development and familiarisation, and its purpose was to practise what had already been lectured in the classroom: counterterrorism search in simulated situations. This significant point should also be reflected in the current Guidance provided by the UK's Civil Contingencies Secretariat.

Citizen participation

Citizen participation through volunteers is an integral part of disaster exercises because the involvement of the general public is crucial to the validity and reliability of disaster exercises (Cabinet Office, 2011). These volunteers are required for most of the live exercises to play victims, their families, passengers, the media and so on, especially for the purpose of creating a degree of verisimilitude. In tune with this trend, the disaster exercises observed in England actively encouraged the involvement of volunteers. Exercise Twin Bore involved citizen volunteers who acted as mock

passengers. When it came to Exercise Saxon Shore, hundreds of volunteers acted as injured people or concerned relatives. Even professional casualty actors from the Casualty Union and the Association of Casualty and Health Simulators were invited to ensure psychological fidelity. Exercise Operation Safe Return also benefited from the active participation of railway and underground staff in terms of combating terrorism on the railway.

The interview findings positively support the importance of public participation in disaster exercises. As a member of the registration staff remarked in Exercise Saxon Shore: 'We recognise their participation is very important to create validity in our exercise.' One volunteer observed: 'I enjoy attending this sort of exercise. It is sometimes very interesting to see their jobs in person. I feel like I am making some contributions to community safety as well.' Interestingly, the emergency services communicated with the public, such as owners and security managers of pubs, night-clubs and shopping centres by providing proper advice on how to handle potential terrorist attacks, prior to the exercise. With reference to the public's role, a member of the emergency services pointed out:

[T]hey are in the front line of fighting against terrorism, and their roles are very important. For this reason, we have spoken to the workers and owners of every establishment and offered them advice on how to deal with, I mean, plan for the potential for terrorist attack.

The active involvement of volunteers in disaster exercises is of great importance because emergency response organisations should also work together with the general public for effective disaster response. Noticeably, such citizen participation can be justified in terms of postmodernism theory. 'Postmodernism' is basically founded on multiplicity and diversity, assimilating various paradigms and ideologies equally (Holtzhausen, 2000; 2002). According to Browning and Shelter (1992), postmodernism possesses four characteristics: simultaneity, chaos, unintended consequences, and multiple realities. They argue that the concept of postmodernism should be applied to crisis and disaster management by allowing different hazard constructions of various organisations and parties to be considered. More specifically, they argue that encouraging different hazard constructions of the public in the decision-making of emergency response situations can address the four problematics of postmodernism. In this context, allowing multiple voices of the public to participate in their planning, exercising and debriefing processes can create a more comprehensive and holistic response to a disaster, rather than a prescribed response by the minority of official responding agencies (Browning and Shelter, 1992; Irwin, 1995; Royal Society, 1992; Tyler, 2005). This recognition should also be reflected in the existing Guidance.

Discussion-based debriefs

An exercise is theoretically based on 'experiential learning' (Kolb, 1984), in which learning is defined as the process of transforming experience into concrete knowledge. However, the transformation process should be supported by reflection on the

experience, because without it, the lessons learnt from the experience might vanish quickly or lose their instructive features (Jaques and Salmon, 2007). In this sense, reflection is argued to be the essence of experiential learning; ‘debriefing’ can be defined as learning through reflection on an experience from the perspective of a disaster exercise (Rath, 1987). In conclusion, the experience obtained from disaster exercises can be examined, discussed and subsequently transformed into learning by debriefing sessions (Thatcher and Robinson, 1985).

All of the exercises observed involved debriefing sessions. During those debriefs, there was significant discussion on ‘what happened’, ‘how prepared we were’, ‘what went well’, ‘what did not go well’, and ‘what can be done better in the future’ immediately after each session. Noticeably, the empirical evidence from the interview findings unequivocally demonstrates the significance of debriefs. The following are the excerpts taken from the interviews:

- Debrief is not a lecture on what we did right and what we did wrong. It’s like a more structured conversation. It is learning from experience.
- During debriefs, we shared emotion and ideas, and discuss what happened, how we responded, and how we can do better next time. That provides better understanding about our job. We are learning from it.
- We are looking at how to implement the learning points into the manuals and exercises.
- Debrief is about constant learning. If someone makes a mistake, we don’t say it is rubbish. We ask, why did you miss it? How did you miss it? What were you thinking then? We talk about something to improve [. . .]. I like debriefs.
- Generally, a debrief is [. . .] about identifying areas for development or improvement [. . .]. Not about criticising, and not about focusing on negatives [. . .]. It’s about giving constructive feedback to people.

Not surprisingly, debriefs were recognised by exercise participants as an important learning tool to improve plans, manuals or procedures among the exercise players in the UK. Nevertheless, in both Exercise Twin Bore and Exercise Saxon Shore, debriefing sessions were limited to only certain professional participants in the exercises. During Exercise Saxon Shore, volunteers were asked instead to fill in feedback questionnaires, which seemed to play a role as a limited written debrief. The stated reason for not soliciting debriefs of volunteers was the need for confidentiality. However, although certain tactical aspects of a counterterrorism exercise should undoubtedly remain confidential from the general public, it is far from obvious why such confidentiality concerns should inhibit the relay of important feedback to the organisers and first-responders in the exercise.

The main problem with using a simple survey questionnaire to obtain feedback from volunteers is that it cannot properly take account of qualitative information, such as volunteers’ opinions, feelings and emotions. Accordingly, given that an important source of recommendations can come from the volunteers, they need to be debriefed orally like emergency services. Disaster exercises in the UK can benefit

not only from volunteer participation, but also from oral debriefs with the volunteers, to make sense of their feelings, emotions and ideas concerning an efficient disaster response. Their suggestions and recommendations are also of great importance for the validation of disaster exercises. While it makes sense for security reasons that government agencies would not wish to highlight vulnerabilities in their response, the lack of open debriefing carries the risk of becoming an echo-chamber of self-congratulation, rather than 360-degree critical analysis.

Conclusion and policy implications

In view of the fact that the recent official UK Guidance on emergency preparedness does not provide any practical guidelines or explanations for conducting exercises, this paper critically examines the actual practices of UK disaster exercises. The research findings indicate that disaster exercises in the UK can be categorised into four main approaches: (1) disaster response and adaptability, (2) building-block approach, (3) citizen participation and (4) discussion-based debriefs. An analysis of these four approaches in practice suggests the following conclusions, which should be reflected in the Guidance.

First, the research suggests that the adaptation of plans, skills and manuals needs to be encouraged, and its importance should also be clearly emphasised and reflected in the official guidance. In a similar vein, Wybo (2008) argues that a degree of flexibility is the key to effective disaster response, rather than simply following conventionality. The findings also show that in reality, the emergency services usually improvise their disaster response plans, procedures and manuals, recognising the significance of 'adaptability' in the event of unanticipated situations. They need to work outside the rules, regardless of standard operating procedures, in certain disaster situations. The Guidance should encourage this flexibility.

Second, the study proposes that, in line with current actual practices, it is helpful to proceed from the simplest type of exercise to more complicated ones gradually. Thus, new plans or manuals should go through discussion-based exercises before large-scale live exercises. The disaster exercises observed for the research employ a building-block approach on the whole, and this point is in need of emphasis in the Guidance. Exercise participants gain confidence in the disaster response abilities cumulatively by this building-block methodology. Moreover, this approach is a cost-effective way to accomplish aims and objectives of an exercise. Accordingly, the present UK Guidance should make it clear that the building-block approach should be employed.

Third, the research suggests a need for the organisers of disaster exercises to get the volunteers more actively involved in oral debriefing sessions. Currently, the disaster exercises do not provide sufficient opportunity for volunteers to reflect on their experiences, feelings and opinions through active oral discussion. Rather, volunteers—if they are consulted at all—are relegated to the mere completion of post-participation questionnaires. Since volunteers are important stakeholders at the scene of a disaster, it is of great importance to make sense of their multiple, qualitative and alternative

viewpoints by proactively involving them in exercise debriefs. This active involvement of volunteers not only in disaster exercises but also in debriefing sessions can result in a more comprehensive, flexible and holistic response to a disaster, particularly in the era of postmodernism. Therefore, the official UK Guidance should underscore the need for more meaningful feedback from volunteers.

Finally, by implementing these evidence-based recommendations, it is hoped that the current void between the current practices and the UK official Guidance in relation to disaster exercises can be filled. It can be cautiously assumed that some of the lessons learnt from the UK's current disaster practices might be generalised to a wider international context. Nevertheless, further research is required to determine whether the findings from UK disaster exercises may be generalised to other cultural contexts.

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