

# INTEROPERABILITY IN A CRISIS 2

## Human Factors and Organisational Processes

Jennifer Cole



Royal United Services Institute

OCCASIONAL PAPER

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Occasional Paper, June 2010

## **Interoperability in a Crisis 2**

### Human Factors and Organisational Processes

By Jennifer Cole

The views expressed in this paper are the author's own, and do not necessarily reflect those of RUSI or any other institutions with which the authors are associated.

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## Acknowledgements

This report revisits research originally published by RUSI in *Whitehall Report 5-06 'Communications Inter-Operability in a Crisis'*, by Sandra Bell and Rebecca Cox. It seeks to explore why barriers to interoperability identified in that report (as well as in several others, conducted both independently and for government) continue to exist and seem difficult to overcome.

The author would like to thank in particular: the Civil Contingencies Secretariat (particularly the Resilience Communications Team and the CCA Enhancement Programme staff), the Office of the Chief Fire and Rescue Advisor, CLG and the Fire and Rescue Service National Resilience Assurance Team, the National Policing Improvement Agency, the Department of Health Emergency Preparedness Division, BAPCO, and Airwave Solutions Ltd for their help and support during the project.

## About the Author

Jennifer Cole is Head of Emergency Management at the Royal United Services Institute, working within the National Security and Resilience Department. Since joining RUSI in January 2007 from a background in journalism and anthropology, Jennifer's research interests have focused on the UK's emergency preparedness and response capabilities, particularly in regard to surge capacity and multi-agency working during major emergencies.

RUSI was invited to present findings from this research project at the Fire and Rescue Service launch events for the National Coordination Advisory Framework, held in London, Yorkshire and Avon from December 2009 to March 2010. The events, which had initially been intended only for FRS staff, were opened up to invited emergency planners and responders from other agencies, to ensure that they would also be made familiar with the new FRS procedures.

It was extremely heartening to see the recommendations from the RUSI interim report acted on so swiftly and RUSI would like to thank Peter House and Brian Ward of NRAT and Martin Smart and Bill Feeley from the office of the Chief Fire and Rescue Adviser for both the opportunity to publicise the research and for acting so swiftly on its interim recommendations.

Her particular research interests include flood risk management, CBRN(E) resilience and response, cyber-security, resilient communications and the role of the media in emergencies. She has operational experience of responding to the 7 July 2005 bombings on the London transport system.

## Executive Summary

Responding to the threats and hazards of the National Risk Register<sup>1</sup> involves a large number of agencies, creating an emergency response community that includes, but is not limited to, the Category 1 and 2 responders of the Civil Contingencies Act 2004.<sup>2</sup> Each of these responder organisations has its own core business model (often including key performance indicators), operating procedures and skill sets, and each uses a wide range of equipment.

The interoperability of this emergency response community is vital to the efficiency and effectiveness of the British response capability. Understanding the community and how its component parts need to work together during major incidents is extremely complex.

In the past, research has tended to focus on the compatibility of the technology and equipment used by the responders. Efforts to improve interoperability have been primarily concerned with ensuring that one responder agency can communicate with another using secure, resilient and compatible information and communication technology (ICT) systems. Interoperability is not about technology, however – it is about people and processes.

Shared radio networks and secure extranets are of secondary importance to the operational procedures of those who need to communicate, who they need to communicate with, what messages they need to communicate, and through what chain of command. The development of new technological solutions will not significantly improve interoperability if the human factors that drive the use of that technology are not well understood. Communication is more than just the ‘C’ of ICT.

Understanding the communication needs – and the use of communications equipment within and between emergency responders – is hampered by the fragmented nature of the emergency response community. There is a lack of standardisation across geographic and force boundaries, and between different organisations, that affects everything from technology acquisition and operational procedures to budgets, training and exercising, and sharing lessons. The situation makes true interoperability extremely difficult, both to understand and to practice.

If the situation is to be improved, a stronger framework for national resilience is needed. More consistency and standardisation is needed across qualifications, training and exercising, operational procedures and planning, as well as across the use of available technology. This standardisation also needs to be mandated, not left to optional take-up.

The current economic climate should act as a driver for improved joint working as organisations will be forced to consider whether capabilities can be shared or held centrally, as there may not be sufficient budget for each organisation or regional force to hold every resource it needs. This should be encouraged and supported centrally, as it will push forward joint working across the board. Without a single responsible owner for the entire community, however, any such reviews will be difficult to conduct and recommendations difficult, if not impossible, to implement.

Despite the challenges, it is important to acknowledge that interoperability has improved in recent years. ‘Soft’ join ups, which enable

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<sup>1</sup> Cabinet Office, National Risk Register of Civil Emergencies (London: The Stationery Office, 2010).

<sup>2</sup> Category 1 responders are those organisations at the core of the response to most emergencies, such as emergency services, local authorities and NHS agencies, and are subject to the full set of civil protection duties. Category 2 organisations, such as the Health and Safety Executive, transport and utility companies, are ‘co-operating bodies’, which are less likely to be involved in the response itself, but who provide services (such as electricity) without which the Category 1 responders cannot operate, or whose loss presents a serious danger to the general public. Cabinet Office, ‘Civil Contingencies Act’, last updated May 2010, <<http://www.cabinetoffice.gov.uk/ukresilience/preparedness/ccact.aspx>>, accessed 10 June 2010.

responders to come together to plan, prepare for and discuss joint working – such as Local Resilience Forums – are popular and should provide the foundation for further improvements. Management and control of incidents needs to remain at the local level, but with stronger mechanisms for national co-ordination.

In considering how emergency response and the management of civil contingencies are taken forward by the new government, the landscape needs to be considered holistically. A better understanding is needed of the relationship between the different responder agencies and how these differences affect the way they are able to work together.

## 1. Background to the Research

In 2005, following the 7 July bombings on the London mass transport system and the report of the 7 July Review Committee,<sup>3</sup> the Royal United Services Institute carried out extensive research into the cultural, political and economic drivers that may limit uptake of available interoperable communications technology within and between Category 1 responders as defined in the Civil Contingencies Act 2004 (CCA) and, in particular, between the three 'blue-light' emergency services: fire, police and ambulance.<sup>4</sup>

The research findings were published in RUSI Whitehall Report 5-06, 'Communications Interoperability in a Crisis'<sup>5</sup> in January 2007. The report made a series of recommendations, including the need for a unified communications policy encompassing all responder communities; and for platforms for multi-agency information flow to be designed for purpose, rather than as systems for the legacy platforms on which responder agencies currently operate.

The first recommendation of RUSI's 2007 report was particularly important in revisiting the research for this current project:

It is therefore recommended that there should be a unified communications policy encompassing all responder communities that ensures interoperability.

A unified communications policy did exist in 2005: that all emergency services should use the Airwave

service, a digital radio communications network that had been commissioned by the Home Office as a result of the Public Safety Radio Communications Project to provide a network shared between the fire, police and ambulance services.<sup>6</sup>

In spite of this policy, not all of the services which were entitled (and intended) to be using the Airwave service on 7 July 2005 were doing so. Though the network had been fully rolled out in May 2005, the Metropolitan Police Service had not yet migrated the service across on their entire force area. The Fire and Rescue Service and the Ambulance Service had been in contract negotiations for some time but neither had, at that point, signed up to the Airwave network.<sup>7</sup> Attempting to identify the core reasons for this lag in implementation of the policy is a key focus of this research project, not just in order to identify why organisations may choose not to adopt recommendations and guidance issued from a central point, but also how this reluctance might be challenged and overcome. The technology exists for all C1 and C2 responders to communicate with one another: the challenge is getting them to use it and to do so effectively.

Discussions with the Cabinet Office and the National Policing Improvement Agency (NPIA) prior to beginning this research confirmed that current efforts to improve interoperability are focused on human factors and organisational processes, rather than on technology. The Airwave network and the National Resilience Extranet<sup>8</sup> provide – or will soon provide – adequate national systems to enable

<sup>3</sup> Greater London Authority, 'Report of the 7 July Review Committee', June 2006, <<http://www.iwar.org.uk/homesec/resources/7-7/london-assembly-report.htm>>, accessed 18 June 2010.

<sup>4</sup> 'Blue light' is the popular term for all services that are contacted via the emergency telephone code (999 in the UK).

<sup>5</sup> Sandra Bell and Rebecca Cox, 'Communications Inter-Operability in a Crisis', *Whitehall Report 5-06* (London: RUSI, 2007).

<sup>6</sup> A full history of the development of the Airwave service can be found in Bell and Cox, *op. cit.*, pp. 26–29.

<sup>7</sup> The Department of Health signed a contract for NHS Ambulance Trusts in England to adopt the same radio communications system (Airwave) as the police in July 2005, shortly after the bombings. The Fire and Rescue Service followed suit in March 2006. Roll-out to all blue-light responders is currently expected to be complete by mid-2010. Bell and Cox, *op. cit.*, pp. 26–29.

<sup>8</sup> This is a secure web-based browser that enables responders to share and exchange information. Cabinet Office, 'National Resilience Extranet – An Introduction', Civil Contingencies Secretariat Resilient Telecommunications Programme, <[www.cabinetoffice.gov.uk/media/131708/nre\\_introduction.pdf](http://www.cabinetoffice.gov.uk/media/131708/nre_introduction.pdf)>, accessed 18 June 2010.

interoperability as long as emergency responder organisations use them.

### **The Research**

This research project therefore focused on exploring what emergency responders think of the current mechanisms and initiatives for enabling interoperability, and where barriers still exist. The research project looked beyond the initial focus on ICT enablers of interoperability, and began instead from the assumption that interoperability depends on much more than technology alone. What exactly those additional drivers and enablers are is not well understood at present.

The research project had two main phases – qualitative and quantitative – that took place over a seven-month period from 2009 to 2010.

#### *Research Phase One: Qualitative Research Phase*

The initial research phase was conducted between 10 August and 11 December 2009 and consisted of twenty-five unstructured, qualitative interviews with key public safety communication stakeholders; including policy-makers, technology developers and end-users, from the public and private sectors. These were face-to-face interviews at the Royal United Services Institute in London and at interviewees' own offices across England. The interviewees were identified as key players in interoperability by RUSI's previous research and through recommendations made by the Cabinet Office resilient communication team. All respondents were approached by RUSI and invited personally to take part. Some interviewees identified other key players who they thought should be interviewed and, where possible, these individuals were also included in the research.

The interviews were built around four key questions:

- How well do you think interoperability is working at present?
- In what way(s) do you think interoperability has improved in recent years?
- What do you think has enabled interoperability to improve in recent years?
- What do you consider to be the main barriers to improving interoperability further?

The interviews were deliberately unstructured to draw out interviewees' impressions of interoperability, and in particular to perceived enablers and barriers. RUSI did not seek to influence the interviewees towards any one particular area of interest or any particular issue(s). In particular, interviewees were not guided towards discussing the impact of technology rather than operational procedures on interoperability, or vice versa.

Interviewees were drawn from Category 1 and 2 responders as defined by the CCA: organisations that support C1 and C2 responders;<sup>9</sup> policy-makers within the Civil Contingencies Secretariat; the UK Department for Business, Innovation and Skills; the Association of Chief Police Officers (ACPO); industry bodies such as BAPCO; the military; and private sector contractors which have worked to deliver public sector ICT projects.

Some of the interviews took place during preparations for the RUSI workshop, Emergency Response 2009: Communicating in a Crisis, held on 7 December 2009. Additional observations came from multi-agency workshops, exercises and conferences attended by RUSI staff during the research period; two of these were invite-only events held behind closed doors, and six were events at which RUSI was invited to speak on this research project specifically. A list of interviewees and events attended during the research process can be found in Annex 1.

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<sup>9</sup> Volunteer organisations were limited to those listed as supporting organisations in the London Emergency Services Liaison Panel (LES�P) Major Incident Procedure Manual, <<http://www.leslp.gov.uk>>, accessed 10 June 2010.

**The Interim Report**

The initial findings were published in an interim report on 1 January 2010.<sup>10</sup> It identified a number of broad themes that hinder or impede interoperability. These are summarised as follows:

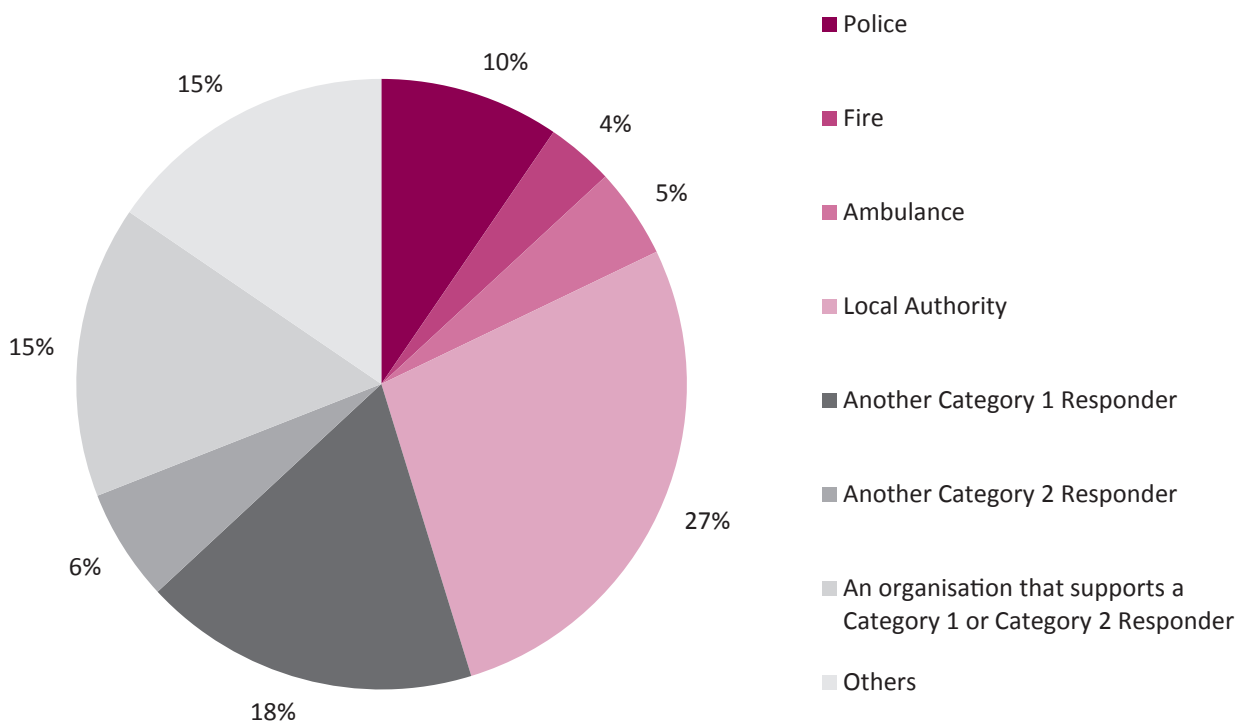
- The emergency response community is extremely fragmented
- There is a need for a stronger framework for national resilience in the UK
- The different needs of emergency responders from the variety of agencies are not always considered sufficiently
- Responder organisations are not always aware of changes, improvements and advances made by others.

The interviews conducted during the qualitative research phase strongly support the starting assumption that technology is not the most important enabler or driver of interoperability.

*Phase Two: Quantitative Research Phase*

The initial findings and the interim report were discussed with the Civil Contingencies Secretariat, Airwave Solutions Ltd and the NPIA in order to formulate a questionnaire for the secondary quantitative stage of research. This second research phase was conducted through a web-based survey, which was live between 1 December 2009 and 30 March 2010.<sup>11</sup>

**Graph 1:** Interoperability Research Questionnaire Respondents by Organisation<sup>12</sup>



<sup>10</sup> The interim report is available at <<http://www.rusi.org/communicationsinterop>>.

<sup>11</sup> The online questionnaire contained more than thirty questions on a number of areas relating to interoperability, not all of which are in the scope of this project to analyse. A number of questions were also included at the request of the Cabinet Office’s Civil Contingencies Act Enhancement Programme. This data does not form part of this research project or report, but offers an opportunity for further work on specific aspects of training and exercising, and the levels of security assigned to multi-agency operations.

<sup>12</sup> ‘Others’ include the military and private sector.

The questionnaire was publicised via key stakeholder databases, including RUSI, BAPCO, and the Multi Agency Airwave User Group; and in appropriate magazines and newsletters, including the *BAPCO Journal*, *Focus* (RUSI e-newsletter), *Contingency Today* and the *Emergency Services Times*. Throughout the questionnaire period, RUSI presented the initial research findings at conferences organised by the Fire and Rescue Service, BAPCO, the Ministry of Defence and at RUSI's own Command and Control conference. Questionnaire respondents were self-selecting.

The questionnaire elicited responses from eighty-four participants from the emergency services, other Category 1 responders, Category 2 responders, national volunteer organisations, private-sector contractors and the armed forces. Respondents represented a good geographical spread across England from Kent to Carlisle, and there were also respondents from Scotland and Wales. A full breakdown of the respondents can be found in Graph 1 (p. 3).

The responses to the key parts of the quantitative survey, along with the comments respondents were encouraged to make to explain their answers, are explored in depth in Chapters 3–6 of this report.

The results from the quantitative survey overwhelmingly confirmed the findings from phase one. Interoperability is not about technological enablers, but about understanding the people who need to use the technology: who they are, how they work together, what information they need to communicate, and who they need to communicate it to. Understanding these relationships lies at the heart of understanding interoperability.

### **Future Research Directions**

At present, the human factors that are vital to the success of interoperability are not as well understood as they need to be. The emergencies the UK has faced since the introduction of the Civil Contingencies Act 2004, and the range of threats and hazards listed on the National Risk Register, have brought with them an expansion of the number and types of organisations that need to be included in the response, from the Royal National Lifeboat Institution working in landlocked counties and urban environments during the 2007 summer floods, to the engineering contractors that are planning the rebuilding of bridges destroyed in the 2009 Cumbria floods. How these organisations work together is vital to ensuring an effective response.

### **Recommendation 1**

Further research needs to be carried out into the social science that enables or inhibits interoperability. At present, funding for this kind of research is much more scarce than funding to research and develop new technology. This needs to change if the drivers and enablers of interoperability are to be fully understood in the future. No matter how well technology works, it will not ensure interoperability if essential players do not want to use it, cannot use it, do not know how to use it or do not know what they are using it for.

## 2. Interoperability: A Definition

In order to ensure efficient interoperability, a clear understanding of which organisations need to operate together and under what conditions is essential.

What is meant by ‘interoperability’, in terms of whom and in what way during multi-agency operations, is neither entirely clear nor consistent. This makes identifying and addressing the needs of the end-users difficult.

Interoperability in some cases refers just to the blue-light services (fire, police and ambulance) and in others to all Category 1 responders as defined by the 2004 CCA. It might also include C2 responders, volunteer agencies, business continuity managers from the private sector, and community responders. The Local Resilience Forums required by the CCA do, of course, bring many of these organisations together and their role will be explored later in this report, but strong definitions of which agencies will be end users of any guidance, policy or technology need to be determined.

The NPIA guidance on multi-agency interoperability defines the term as follows:<sup>13</sup>

The capability of organisations or discrete parts of the same organisation to exchange operational information and to use it to inform their decision making ... Interoperability must be considered for incidents and events in the same service and across different services, where working to a common purpose within a unified framework with a common command culture is critical to success. This can be at the local, regional or national level.

This NPIA definition, in large, is taken from NATO’s definition:<sup>14</sup>

Interoperability refers to the ability of different organisations to conduct joint operations ... Interoperability allows forces, [organisations] or systems to operate together. It requires them to share common doctrine and procedures, each others’ infrastructure and bases, and to be able to communicate with each other ... It reduces duplication ... allows pooling of resources and even produces synergies among members. Interoperability does not necessarily require common equipment. What is important is that this equipment can share common facilities and is able to communicate with other equipment.

Both of these definitions recognise the importance of operational procedures as well as the need for compatible technology.

### Complexity of the Response

The number of organisations involved in a multi-agency response can be vast. The Pitt Review into the 2007 summer floods, for example, lists:<sup>15</sup>

- 28 Emergency service organisations (regional fire, police, ambulance services)
- 28 Community groups
- 13 Voluntary organisations
- 86 Local government organisations (county and city councils)
- 32 Utilities and critical infrastructure providers
- 33 Central government departments and agencies
- 10 Regional government offices
- 43 Local Resilience Forums.

<sup>13</sup> National Policing Improvement Agency, ‘Guidance on Multi-Agency Interoperability’ (Wyboston: Specialist Operations Centre, 2009), <[http://www.npia.police.uk/en/docs/Multi-agency\\_Interoperability\\_Secure\\_130609.pdf](http://www.npia.police.uk/en/docs/Multi-agency_Interoperability_Secure_130609.pdf)>, accessed 10 June 2010. The NPIA guidance is intended primarily for use by the Ambulance Service, Fire and Rescue and Police Service in England, Northern Ireland, Scotland and Wales. The document is endorsed by ACPO, the NPIA, the NHS Ambulance Chief Executive Group, the Chief Fire Officers Association, Department of Communities and Local Government, the Department of Health, Scottish Resilience, Chief Fire Officers Association Scotland and the Scottish Ambulance Service.

<sup>14</sup> NATO, ‘Interoperability for joint operations’, July 2006, <<http://www.nato.int/docu/interoperability/interoperability.pdf>>, accessed 10 June 2010.

<sup>15</sup> Cabinet Office, ‘Annex D: List of organisations and members of the public who have contributed to this review’, *Final Report; Learning from the Floods* (London: The Stationery Office), pp. 428–36.

The sheer number and diversity of organisations that may need to 'interoperate' is also demonstrated by the many different incidents, operations and events that demand these systems (see Box 1). The range of the possible case studies alone helps to illustrate the challenges inherent in enabling interoperability.

This project did not set to define the organisations 'within' the sphere of interoperability for the purpose of this research, nor those 'outside' it. Instead, respondents were invited to describe organisations with whom they needed to share information during the planning, response and recovery phases, as a means of determining the 'interoperability sphere'.

### **Preparing for the Unexpected**

The aim of this research is not to address issues of interoperability during routine, day-to-day operations (such as the involvement of police, fire and ambulance in a single road traffic accident) nor necessarily during planned large events such as the London 2012 Olympic and Paralympic Games. It is concerned only with unexpected major incidents that would require a large-scale response across many agencies and potentially across geographical boundaries. This includes major terrorist attacks, such as the suicide bombings on the London mass transport system on 7 July 2005 and the severe flooding experienced in many of the areas of the UK during summer 2007.

Of course, the more joined-up organisations are during their routine operations, the more easily they may be able to join up during a major incident. But it is not yet clear how similar command and control of planned and unplanned events has to be, since solutions for one type of incident may be assumed to be appropriate for others, when this is not the case.

### **Box 1: Case Studies for Consideration**

The number of different incidents and types of incident highlighted by respondents demonstrates the complexity of the challenge faced in achieving interoperability.

#### **Incidents**

- Herald of Free Enterprise ferry disaster, Zeebrugge, Belgium, March 1987
- Fuel disputes, UK and Europe, September 2000
- Foot and Mouth outbreak, UK, 2001
- G8 protests, Gleneagles, Scotland, July 2005
- 7/7 bombings, London, England, July 2005
- Hurricane Katrina, US, August 2005
- Gloucestershire floods, England, July 2007
- Channel Tunnel fire, England and France, September 2008
- Mumbai terrorist attacks, India, November 2008
- Black Saturday bush fires, Victoria, Australia, February 2009
- G20 Protests, London, England, April 2009
- New Year's Eve, UK, annual
- Notting Hill Carnival, London, England, annual.

#### **Ongoing Challenges**

- Air Traffic control, international integration
- Transport for London, GPS tracking of all buses inside the M25, London, England
- Singapore, transfer of information to the public.

### **Recommendation 2**

Further research is needed into the relationship between multi-agency working during routine operations, planned large events, and major emergencies, in order to understand to what extent they are similar and to what extent they differ.

### 3. The Fragmentary Emergency Management Community

#### **Key Research Finding 1: The fragmentation of the emergency management community is a barrier to interoperability**

The research found that the fragmented nature of the emergency management community<sup>16</sup> impedes interoperability due to a lack of standardisation across geographic and force boundaries, and between different organisations. This affects everything from technology acquisition and operational procedures to budgets, training and exercising, and sharing identified lessons. The situation makes true joint interoperability extremely difficult and creates frustration within the practitioner community.

The qualitative interviews conducted during the first stage of the research pointed repeatedly to the fragmented nature of the UK emergency management community, which has no hard structure such as that provided by the Federal Emergency Management Agency (FEMA) in the United States, or the Ministry of Civil Defence and Emergency Management in New Zealand. The quantitative phase identified silo thinking as the biggest perceived barrier to interoperability. Less than one in six respondents consider technological barriers to be an issue.

The fragmentation of the UK's emergency management community is considerable. At a governance level, the three main blue-light emergency services sit under three different government departments: the police under the Home Office, the fire and rescue service under the Department of Communities and Local Government (DCLG) and the ambulance service under the Department of Health.

When the emergency response community is expanded past the blue-light services, the sector fragments further: of the other Category 1 responders, the Environment Agency is part of the Department for Food and Rural Affairs (Defra); local authorities come under DCLG; and the Maritime and Coastguard Agency is an executive agency of the Department for Transport. The Category 2 responders, including telecommunications, gas, electricity, water and sewage, and transport utilities are in many cases owned entirely within the private sector and are not answerable to any government department, other than regulators such as the Office of Communications (Ofcom) and the Water Services Regulation Authority.

There is, therefore, no single responsible owner of the emergency services in the UK in terms of an organisation (such as FEMA) or an individual (such as the minister for civil defence in New Zealand). In addition, the response to some of the threats and hazards on the National Risk Register has no single responsible owner either, particularly flooding, for which no emergency service has a statutory duty to respond.

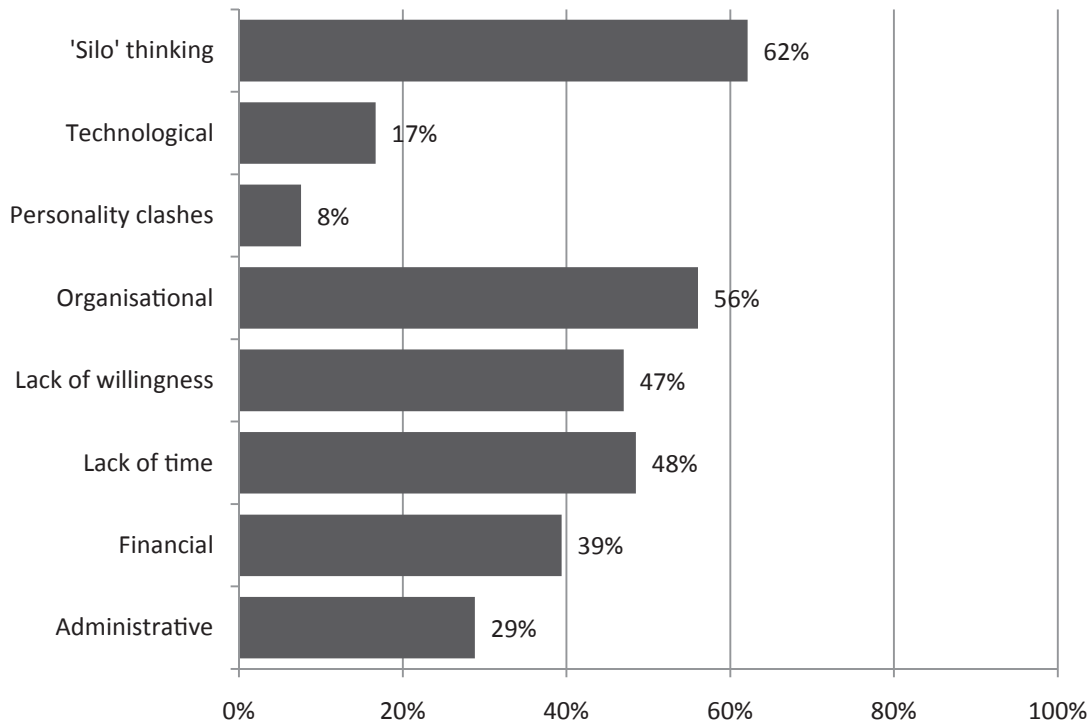
Furthermore, within the emergency services themselves, ownership and governance is regional rather than local. There are forty-six separate fire and rescue services<sup>17</sup> in England, which are governed by one of four different models of fire authority in England alone: metropolitan (such as Merseyside), county (such as Gloucestershire), combined (for instance, Avon) or the London Fire and Emergency Planning Authority. There is no single national fire authority. There are fifty-two police forces plus an additional eight non-geographic forces such as the British Transport Police and the Civil Nuclear Constabulary<sup>18</sup> and twelve NHS Ambulance Trusts

<sup>16</sup> This term is used loosely to mean 'everyone involved in the response to the incident' which may include, but not be limited to, Category 1 and 2 responders defined by the CCA; national volunteer organisations that support them, as listed in LESLP Major Incident Procedure Manual; and community groups and other organisations of the type who contributed to the Pitt Review into the 2007 summer floods.

<sup>17</sup> The Fire Service, <<http://www.fireservice.co.uk/information/ukfrs.php>>.

<sup>18</sup> The UK Police Force, <<http://www.police.uk/forces.htm>>.

**Graph 2:** The Main Barriers to Organisational Interaction



in England, with separate ambulance services in Scotland, Wales and Northern Ireland. In each regional service, the chief executive (usually the chief fire officer, chief constable or equivalent) holds power and is their own manager. There are national associations for each service that are able to set strategy and discuss policy, such as ACPO, the NPIA, the Ambulance Service Chief Executives Group and the Chief Fire Officer's Association (CFOA), but these have no constitutional power over their members, and individual chief officers are largely free to ignore policy or strategy decisions if they so choose. Guidance, policy, and even technology are rarely mandatory and are legally unenforceable.

As a result, it is often difficult for the organisations setting the policy and guidance to push it through and ensure that it is acted upon, hindering and impacting co-ordination and interoperability at every level. There is no single strategic or management organisation that can take a top-down approach across the entire emergency management community, nor that can speak with a single voice for the emergency services. The strategic bodies

that do exist, such as those named above, the Local Government Association and the Civil Contingencies Secretariat (CCS) within the Cabinet Office, can set policy and issue guidance but often have little real power to push through change or legislation. This is even true within their own organisations (for instance ACPO and the NPIA have no real power over individual police forces), let alone between services.

The lack of a single start (or end) point for any decision or action affecting the entire emergency response community means that there is no shared ownership or governance of projects conceived to benefit multi-agency working. Any such project (such as the Public Safety Radio Communications Project, which eventually led to the development of the Airwave network shared by emergency responders) has to be owned and led by one government department. In most cases related to emergency management, this has been the Home Office, through the police. Training and exercising is largely run within each service at their own training facilities, with few national standardised curriculums or qualifications.

There is a perceived lack of neutrality in any initiative that seeks to improve the situation. Interoperability programmes and projects tend to be accused of bias toward the initiator organisation (for example, in the case of projects begun within the Home Office, towards the police), with the

needs of its own members prioritised at the expense of equal consideration for all end-users. This creates a barrier to full engagement by all end-users – but at present the situation is inevitable as there is no genuinely neutral point from which any such project can start.

### Recommendation 3

The emergency services would benefit from a single responsible owner at national level, in order to bring the disparate organisations together, make joint-working easier during planning, exercising, response and recovery, and ensure there is oversight of the work of individual organisations in the context of emergency management as a whole.

In the absence of a single agency responsible for all Category 1 and 2 responders, ownership of multi-agency interoperability projects should not sit within one government department (and therefore one Category 1 responder agency) but be genuinely cross-departmental. The Civil Contingencies Secretariat within the Cabinet Office is the best currently available home.

Ownership by one organisation or department also attracts accusations of uneven input from the entire community. For instance, the interoperability programme within the NPIA includes subject matter experts seconded from the other C1 responders to represent the Ambulance Service, the Fire and Rescue Service (FRS) and the non-blue-light agencies (including local authorities). However, many non-police respondents interviewed during the research remarked that these were at a relatively middle management level on the project, and questioned how much influence they could really have over the more senior police managers. It has not been within the scope of this research to investigate whether or not these criticisms are valid (though impressions would largely suggest they are not), but the perception alone affects the acceptance of the project's validity amongst the wider emergency management community.

One possible way to ease this apparent bias might be to rotate the senior management positions on projects between the C1 responders. This should (especially if the bias is perceived rather than actual) have relatively little impact on the day-to-day running of such projects, but might help to improve opinion amongst the emergency management community. With this in mind, however, overall ownership (or at least the senior management oversight) of joint-service projects would sit better within the Cabinet Office than within the Home Office.

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There is a complete lack of commonality and standards across the country and regionally with hundreds if not thousands of variations in plan types and response types.

Category 1 Local Authority Responder

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### Recommendation 4

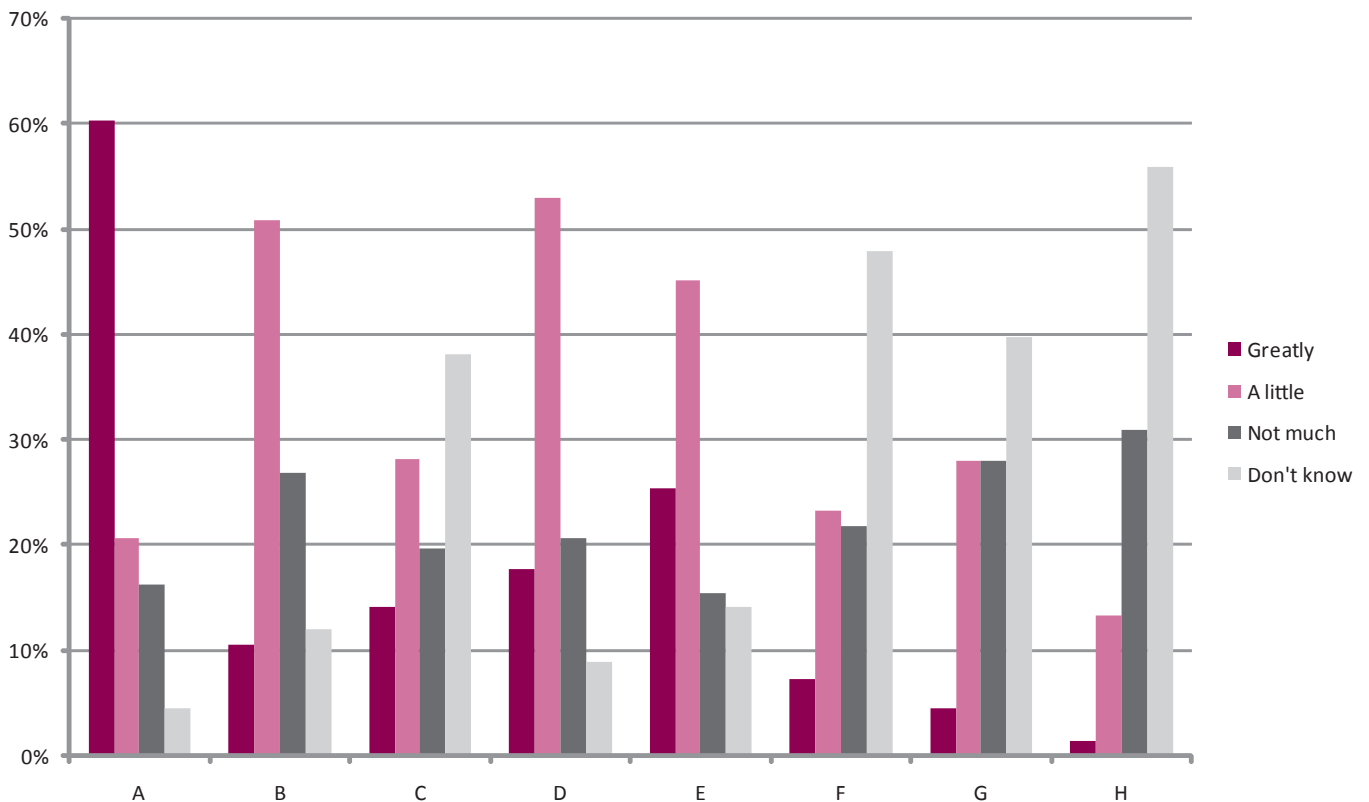
If interoperability projects have to sit within a government department responsible for only one or some of the end-user agencies, senior management positions should be rotated between the end-user responders regardless of the ultimate ownership of the project. It would be more appropriate, however, for them to sit within the Cabinet Office, with representatives from the end-user agencies seconded into the CCS for the duration of the project.

**Improving Interoperability: Preferred Models**

The interviews undertaken during the early research, as well as discussions and presentations at workshops and conferences, identified a number of models that have improved interoperability within the emergency response community in recent years. These included hard join-ups (where existing emergency response organisations would be restructured under a single central agency, such as FEMA in the United States), and soft join-ups, in which each agency retains its legislative independence, but a stronger framework is developed for joint working. An example of a soft join-up would be Local Resilience Forums (LRFs),<sup>19</sup> which could be strengthened by permanent staff, increased budgets and powers to mandate certain training or equipment standards.

This was tested in the quantitative phase and the results confirmed that ‘soft’ join-ups are the more popular model. Local Resilience Forums in particular scored highly and most respondents would like to see LRFs strengthened, with legal status, permanent staff and access to centralised budgets provided by central government. Respondents held differing views about whether they thought their LRFs operated as well as they should, but strengthening them was seen as advantageous by those respondents who consider their LRF to be weak, as well as by those who thought theirs currently operates well. Making it a legal entity would enforce standards on the LRF that would need to be met, as well as on its constituent members. Part of this idea of strengthening LRFs at the local level was the creation of National

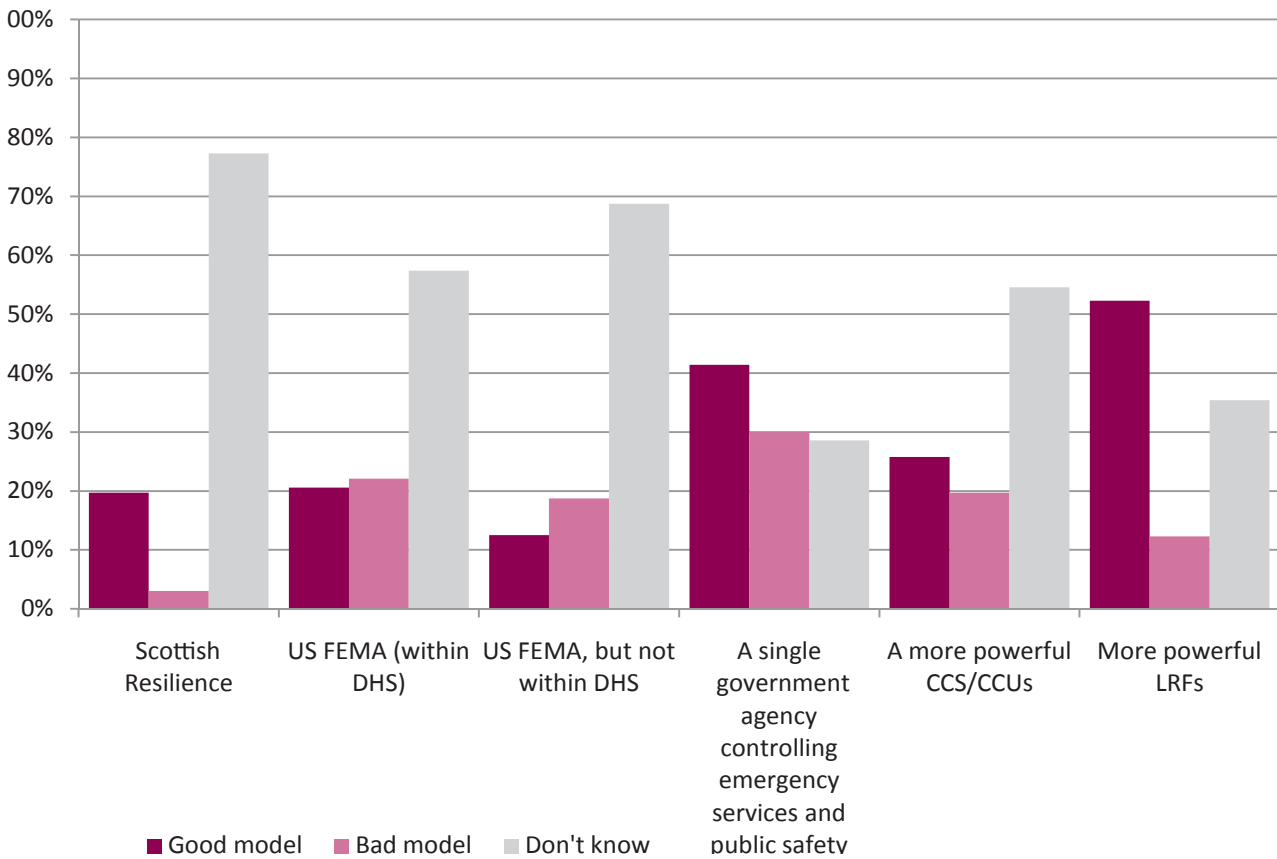
**Graph 3:** Which initiatives have contributed to, or will contribute to, greater interoperability?



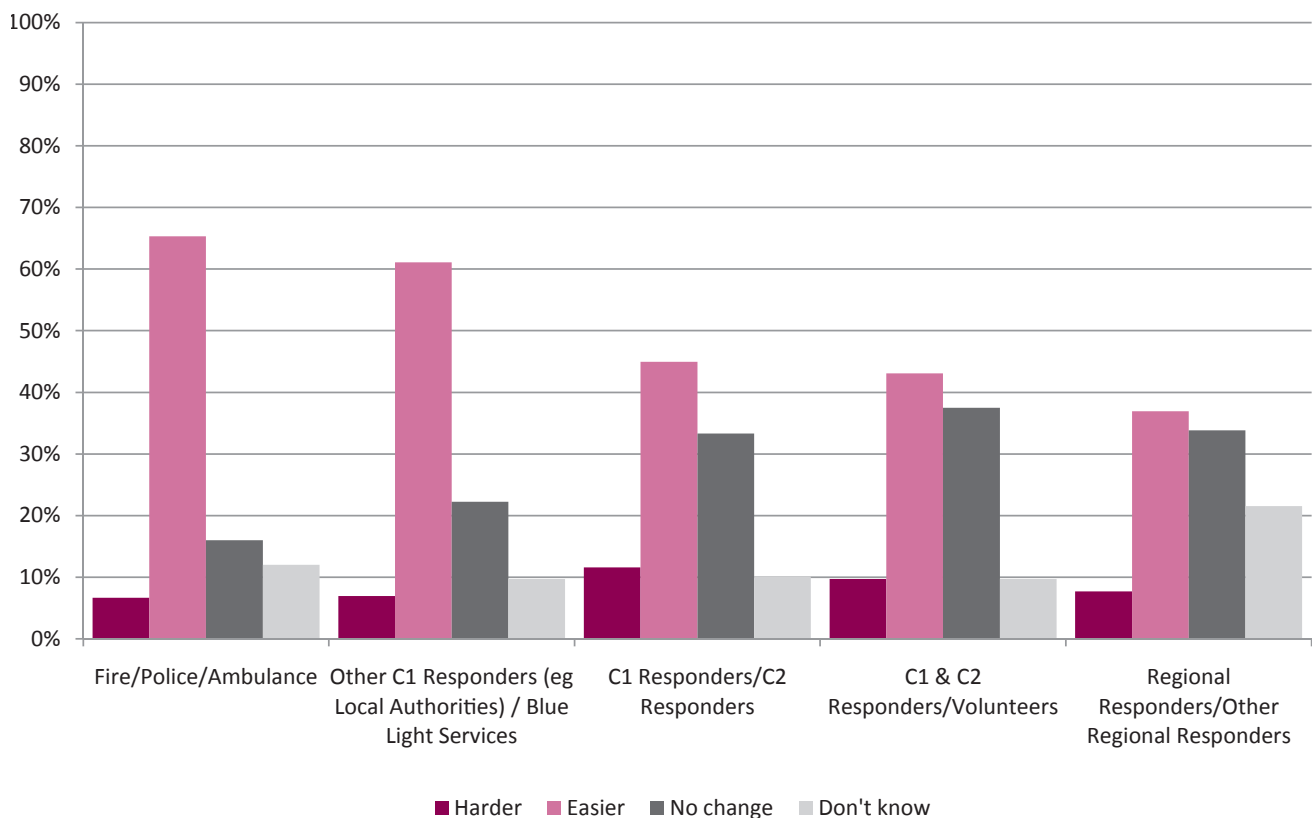
A – Local Resilience Forums. B – Government Office’s Civil Contingencies Units. C – NPIA Interoperability Guidelines. D – Civil Contingencies Secretariat Guidance. E – Airwave. F – National Resilience Extranet. G – Gold Standard. H – Skills for Justice.

<sup>19</sup> A Local Resilience Forum is a multi-agency partnership made up of Category 1 responders and supported by Category 2 responders and wider partners such as the military and the voluntary sector. The LRF aims to plan and prepare for localised incidents and catastrophic emergencies. Together, the members of the LRF identify potential risks and produce emergency plans to either prevent or mitigate the impact of any incident on local communities.

**Graph 4:** Which models should be utilised in improving large-scale emergency response in England?



**Graph 5:** Over the last five years, has it become easier for emergency responder organisations to work together?



Resilience Forum which could recreate the format at national level, with Regional Resilience Forums and/or Regional Civil Contingencies Units potentially offering a middle layer. The regional level is felt to be important as emergencies do not adhere to LRF boundaries, and there needs to be some filtering mechanism between multiple LRFs and the Cabinet Office Briefing Room (COBR).

It is worth pointing out here that the state of interoperability in the UK is not considered to be poor (see Graph 5), nor that improving it needs to start from scratch. There are many good examples of projects and programmes that are pushing interoperability forward, including the NPIA Guidelines on Multi-Agency Interoperability published in 2009;<sup>20</sup> the Ambulance Service Hazardous Area Response Teams<sup>21</sup> which train at the Fire Service College in Moreton-in-Marsh and work closely with the Fire and Rescue Service – particularly with their Urban Search and Rescue Teams; and the discussions on shared facilities and control rooms that are ongoing between responder agencies in some regions.

Whenever a current enabler of interoperability was mentioned during the interviews, or where specific impressions of it were sought, it was rare that the idea of the enabler was considered to be poor, more that the implementation of its use was incomplete or difficult. For instance, there was frustration that systems such as Gold Standard (the Cabinet Office-sponsored training system for Gold and Silver incident commanders) and the

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A single government agency is not feasible because of the diverse nature of the public safety sector. It may improve things during emergencies, but it would not improve normal work for most organisations ... more power to the CCS and LRFs to ensure that arrangements for emergencies are in place across government and across responder agencies would be the better way forward.

Category 1 Local Authority Responder

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National Resilience Extranet are not mandatory and that they are not fully meeting the needs of the end-users. No respondents dismissed them as inherently bad ideas.

In total, 65 per cent of respondents felt that it has become easier for the blue-light services to work together in recent years; and more than 60 per cent of respondents felt that it has become easier for the blue-light services and other C1 responders to work together. On average, less than one in ten thought the situation has deteriorated in recent years, although 88 per cent of respondents to the quantitative survey believe that the responder agencies could still be more joined-up.

It is also worth noting that during the course of this research, the *BAPCO Journal* conducted a poll amongst its readers on the question: 'Would the emergency services benefit from sitting under a single government department instead of three?' The results have been virtually identical to those produced by RUSI's survey, with almost two-thirds of respondents supporting the idea of a single department (63 per cent as of 17 June 2010).

### Recommendation 5

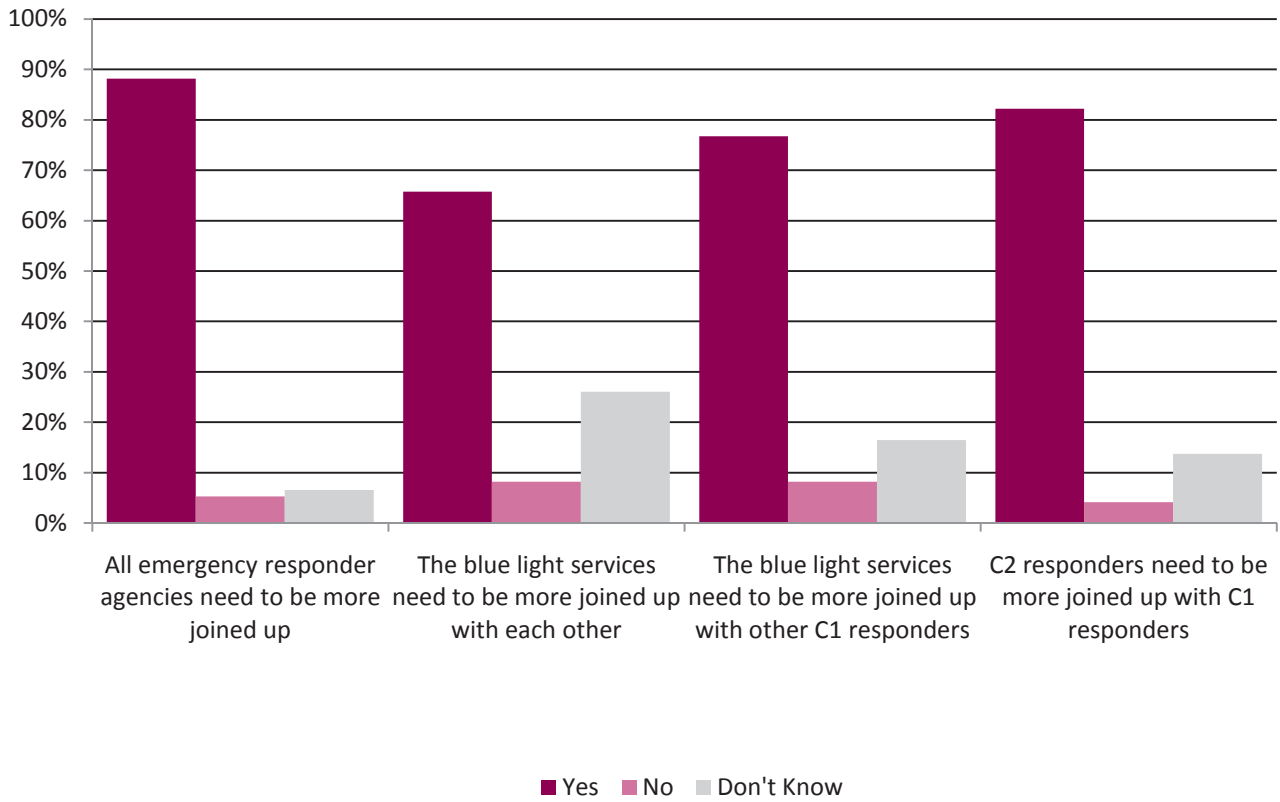
Local Resilience Forums, and the LRF structure, should be taken as the basic foundation for pushing interoperability forward.

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<sup>20</sup> National Police Improvement Agency, 'Guidance on Multi-Agency Interoperability', <<http://www.npia.police.uk/en/13291.htm>>, accessed 10 June 2010.

<sup>21</sup> Ambulance Hart, 'Hazardous Area Response Team', <<http://www.ambulancehart.org>>.

**Graph 6:** Which organisations need to be joined up for improved interoperability?



## 4. A Strong National Resilience Framework

### **Key Research Finding 2: There is a need for a stronger framework for national resilience in the UK**

A stronger framework for national resilience in the UK is needed. There should be more consistency and standardisation across qualifications, training and exercising, operational procedures, use of the available technology and emergency planning. Guidance and operating procedure needs to be mandated, not left to optional take up, and would benefit from centralised administration and budgets. Scottish Resilience and the FRS National Resilience Assurance Team provide good models that could be used as foundations for such a framework. Management and command of major incidents needs to remain at the local level but with better mechanisms for national co-ordination of shared assets and mutual aid. More research is needed to establish exactly what this framework should be.

The qualitative and quantitative results discussed in Chapter 1 (and the quantitative survey carried out by BAPCO in the first half of 2010 and referred to on page 12 of this report) suggest that the emergency services would benefit from being more joined up within a framework that not only enables policy and guidance to be set, but which also has legal and legislative powers to ensure that such policy is implemented and guidance acted upon.

The qualitative interviews identified a number of opinions on what this framework might be: a 'hard' join-up with a narrow top that places responsibility for emergency management under a single government agency with a single responsible owner; or 'soft' join-ups which make it easier for the existing C1 and C2 responders to work together without taking away their independence or individual governance structures. Suggested examples include a National Security Agency; a National Resilience Forum; or a national operations centre that can co-ordinate the response but would not command it.

Respondents highlighted a number of projects that have been successfully introduced in recent years that have helped to facilitate national co-ordination and capability both within and between emergency agencies. These included programmes such as the Department of Health's Hazardous Area Response Team programme which trains closely with the Fire Service for Chemical, Biological, Radiological, Nuclear (CBRN) and Urban Search and Rescue incidents; the Fire and Rescue Service's New Dimension programme, including the National Co-ordination Centre in West Yorkshire and the National Resilience Assurance Team; and multi-agency CBRN training at the Police National CBRN Centre at Ryton. All of these were offered as examples of where interoperability works well, either between agencies or between individual services of the same agency, and which could be used to inform best practice for future projects.

However, while many individual projects were praised, the UK in general and England in particular still lacks an overall framework for resilience projects and joint working compared to, for example, that provided by Scottish Resilience. Projects often focus on one area of response only (such as Urban Search and Rescue, or CBRN) leading to silos and duplication. This is often a result of such projects being developed in isolation, from the bottom up rather than the top down, and with no doctrine or strategy to underpin them. Often, they are developed from within one responder organisation only, largely due to the issues highlighted in Chapter 3, and are then difficult to roll out across the others even where there is a good case for doing so.

A stronger framework which might include, for example, a single budget for some resilience activities, national standards for training and exercising, or legislation, standards and compliance to govern certain activities, might help to strengthen the existing links and build on the good work that already exists. Joining up the work of, and ensuring co-operation between, programmes such as the NPIA Interoperability programme, the FRS

National Resilience Assurance Team, and the Civil Contingencies Act Enhancement Programme to ensure that programme staff are working together to share findings and to develop joint best practice, should be a priority.

The current economic climate may be a driver for joint working as organisations are forced to consider whether capabilities can be shared with others, or held nationally rather than locally, as there may be insufficient budget for each organisation, or each regional force, to hold every resource it may need. This should be encouraged and supported by central government, as it offers an opportunity to push forward joint working across the board.

The quantitative phase of the research posed the following question based on the models suggested and discussed during the qualitative interviews: ‘Do you think the introduction of the following things would be an advantage or disadvantage for ensuring a more efficient and better managed emergency response?’

Results and analysis are provided below for each answer in turn.

**1. National Security Agency**

The quantitative research phase returned the following results in support for a national security agency:

Advantage	Disadvantage	Don't Know
41%	21%	38%

While there is support for a single government agency, this is not universal. The question returned a high number of ‘don’t knows’. Amongst those who did express a view, there is some concern that any such agency should not be a mirror of the United States’ Department of Homeland Security (DHS), which is largely felt to be too focused on counter-terrorism.<sup>22</sup> Less than half of the respondents to

**Box 2: The MoD as a model for an Emergency Services Agency**

While this research does not attempt to suggest the MoD as an ideal model for a single top to the emergency services, there are parallels that can be drawn between the MoD and a potential ‘Ministry of Emergency Management’ that might benefit the emergency services.

Under the MoD, the British Army, Royal Air Force and Royal Navy retain their own identities and their own command structures but are able to join-up to set policy and doctrine, and to share research and development projects. Practitioners and end-users – serving members of the armed forces – sit side by side with the policy-makers in the MoD building and not only help to shape policy, but in many cases then return to theatres of operations to see the implications of those policy decisions in the field. The flow of information between practitioners and policy-makers is constant and continual, providing a feedback loop that benefits both sides.

In addition, the Permanent Joint Headquarters (PJHQ) provides a facility for planning and executing joint operations.

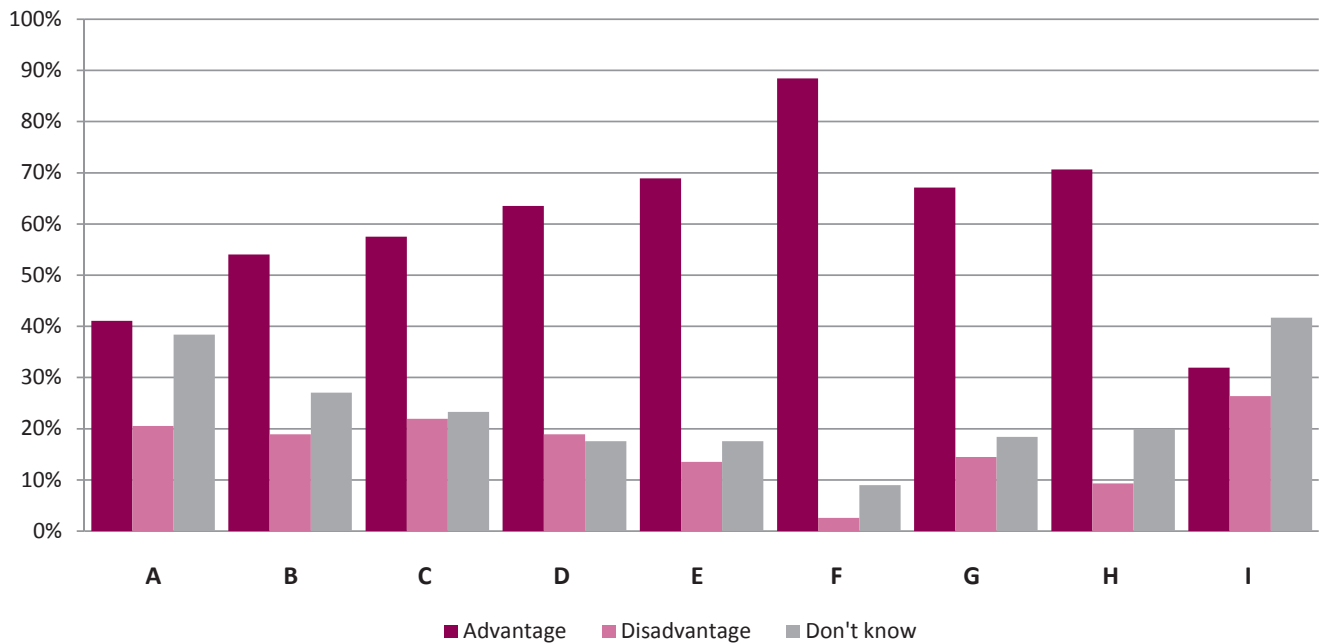
The lack of similar structures within the emergency services hampers joint working. An emergency services version of PJHQ has been discussed more than once in the past but never taken forward. When this was mentioned by interviewees, it was generally with frustration. The idea should be revisited.

the quantitative survey who expressed a view felt that the DHS would be a good model for the UK to adopt (see Graph 4, p. 11).

Amongst those who were in favour of such an agency, respondents thought it could take on the ability to co-ordinate resilience budgets nationally in order to more easily facilitate cross-agency and cross-region working; the organisation, running

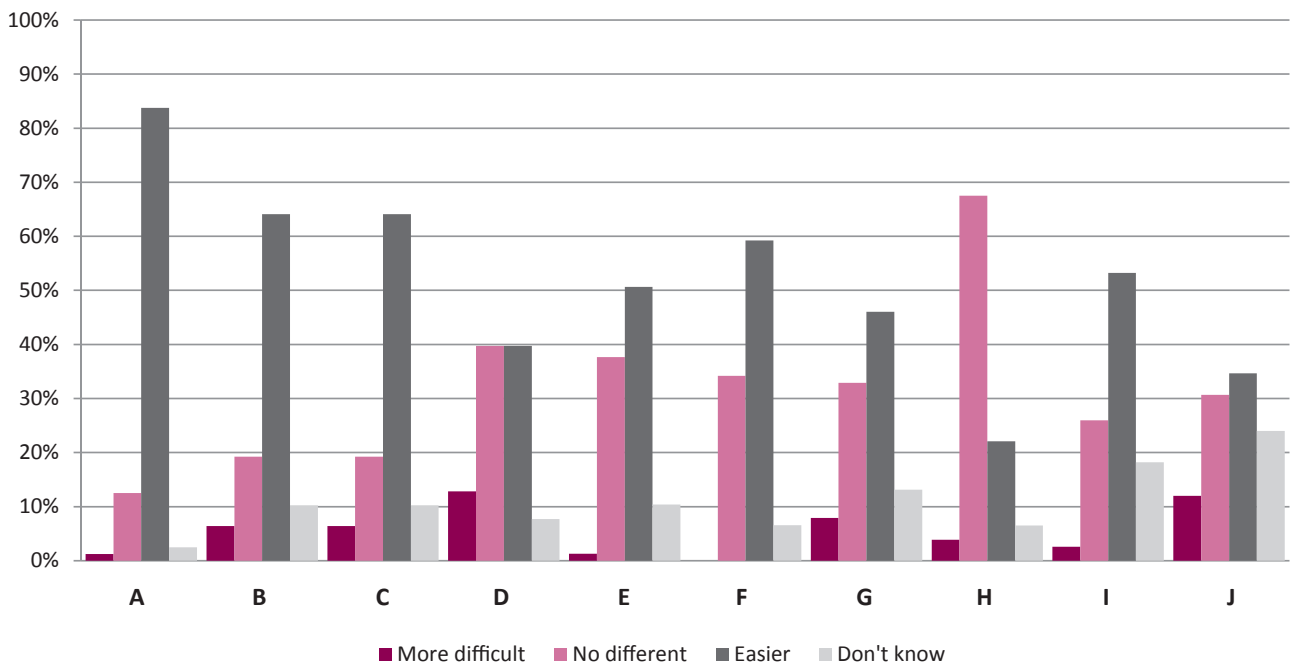
<sup>22</sup> Richard Weitz, ‘DHS: Five Years On’, *Homeland Security and Resilience Monitor* (Vol. 7, No. 5, June 2008); and Jennifer Cole, ‘Securing our Future: Resilience in the Twenty-First Century’, *RUSI Journal* (Vol. 155, No. 2, April 2010).

**Graph 7:** What could ensure a more efficient and better managed emergency response?



A – A National Security Agency. B – A National Resilience Forum. C – A National Operations Centre. D – A Central Resilience Budget. E – National Procurement Programmes. F – National Training Courses. G – A National Exercising Agency. H – National Statutory Guidelines. I – More Legal Mandates.

**Graph 8:** What would improve interoperability with other emergency management organisations?



A – More opportunities for exercising. B – More mandated exercises run by central government. C – Mandated training courses run by central government. D – More statutory guidance/instruction from central government. E – Better equipment. F – The equipment currently available being cheaper. G – Centralised budgets for equipment procurement. H – More frequent LRF meetings. I – Permanent staff for LRFs. J – Centralised administration for resilience activities.

and validation of national training and exercising programmes, (including accrediting individuals and organisations to ensure common standards), and the administration of national procurement programmes, to both drive down unit prices and to ensure standardisation of equipment across organisations and regions. It was felt that such an agency should have the power to mandate policy and technology standards and to ensure that policy was implemented. Such an agency should also run any shared national resilience assets such as the Emergency Planning College.

It was generally felt, and preferred, that such an agency could be achieved without needing to merge the emergency services into a single organisation: it would function more like the relationship between the Ministry of Defence and the three armed forces of the British Army, Royal Navy and Royal Air Force, each of which retains its individuality within the 'greater whole' of the MoD (see Box 2, p.15).

It was also strongly felt that such an agency should not take the command of the incident away from the local incident commander, but instead provide support and guidance to them in the event of a major incident. The creation of such an agency need not (in fact should not) impact on each emergency service's routine operations.

Respondents envisaged such a national resilience agency providing a small permanent staff who would work closely with the CCS and Emergency Planning College. Staff roles might include:

- Providing experienced tacticians to plan and run national, multi-agency and/or cross-region training exercises in order to ensure national standards.

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Resilience needs to be driven by the LRF but within national guidelines and with national support to deliver a local response and solution to an event. If the problem became so severe that the local response was swamped, there would then be a national framework for a wider mutual aid response to fit into.

MoD Responder

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- Management and administration of the Airwave network, including responsibility for managing a national fleet map, national call signs, all talk groups and a national CEI<sup>23</sup> and also of the National Resilience Extranet
- Holding national resilience budgets and running national procurement programmes for resilience, incorporating current programmes such as the Fire and Rescue Service's FireBuy to ensure cross-organisation consistency
- Set policy on resilience and ensure that it is actioned
- Providing a single voice on emergency response and resilience issues and report into the CCS on such issues
- Commission and fund academic research to help build emergency response and resilience doctrine.

Incidentally, support for a national security agency amongst survey participants dropped slightly (by 3-4 per cent) following the publication of the Conservative Party Green Paper 'A Resilient Nation', which made a similar proposal. The reasons for this are beyond the scope of this paper.

## Recommendation 6

The government needs to be mindful that support for a single government agency responsible for all the emergency services is not universal, and must take the concerns of responders into account.

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<sup>23</sup> The Communications Electronic Instruction is essentially a telephone directory listing all call signs.

**2. National Resilience Forum**

The quantitative research phase returned the following results on support for a national security agency (see also Graph 4, p. 11):

Advantage	Disadvantage	Don't Know
54%	19%	27%

During the qualitative phase of the research, the preferred model that emerged for any single top to the emergency services community was one of a soft join-up in which responder organisations are able to come together to assess capabilities and get to know one another's roles and responsibilities; but in which they each retain their independence, without a single government department or ministry sitting above them. This was borne out by the quantitative results in which a national version of the Local Resilience Forum model scored highly as a preferred framework.

Arguments for a National Resilience Forum over a National Security Agency included the strong feeling amongst many respondents that the police, fire and ambulance services (and other C1 and C2 responders) needed to maintain their individual identities, as the vast majority of their day-to-day core activities are specific to their agencies, and do not require multi-agency co-operation. A National Resilience Forum would plan and prepare for multi-agency major incidents, but would not impinge on 'ordinary' operations such as the crime prevention, detection and criminal management duties of the police, or the general healthcare duties of the Department of Health. The Department of Health would be very reluctant to separate management and administration of the Ambulance Service Trusts and ambulance paramedics from the rest of the NHS, for example.

A National Resilience Forum would be a looser and more flexible framework than a National Security Agency, able to adapt and modify its membership according to the incident and to bring in specialists easily as and when required.

**3. National Operations Centre**

The quantitative research phase returned the following results on support for a national operations centre:

Advantage	Disadvantage	Don't Know
57%	21%	22%

During phase one of the research a number of respondents felt that interoperability would be improved by a national operations centre that could co-ordinate (but not command) the response to large-scale events, and make operational decisions while COBR focuses on policy decisions. A suggestion for how this might operate included such a centre being staffed by a 'national strategic co-ordinating group', operating on the same principles as the Gold Strategic Co-ordinating Groups but at a national level. During a wide-area event, the operations centre staff might filter and analyse information from multiple Golds in order to brief COBR, and could also co-ordinate requests for additional resources from regions via LRFs, and from different organisations.

Respondents did stress, however, that any such national operations centre should be just that: an operations centre, and not a control room. It should run the logistics, not the incident. It was strongly felt that the incident itself must be commanded locally and the strategic decisions should still be made by COBR. A national operations centre could, however, control the resources and mutual aid sent

**Recommendation 7**

The development of a National Resilience Forum to enable responder agencies to work together to assess capabilities and to plan a co-ordinated response without losing their individuality should be a priority for the government. There is widespread support for this model as a driver for interoperability between C1 and C2 responders.

to that region, the national assets deployed to it, the future planning of the incident (particularly in terms of how it may develop over time and which region it might impact on next) and develop national situational awareness that could be used to inform COBR's decisions. It should not take power away from the regions, nor from the local incident commander, but rather help to provide him or her with the resources needed to manage the response as effectively as possible, including the provision of expert knowledge, such as scientific expertise, where required. The system should respect existing hierarchies for local emergencies.

There was enthusiasm for the idea that the National Olympic Coordination Centre being developed for the 2012 London Olympic and Paralympic Games should remain as a legacy provision afterwards. It could be used not only during large-scale emergencies but also for national events such as future World Cups or Commonwealth Games and other planned events such as the Notting Hill Carnival. Interviewees felt that if such a centre was to exist permanently, it would be important to ensure that it was used continuously, both to justify costs and to build-in familiarity with its staff and operating procedures. The permanent staff would run the centre during exercises and actual events. It was felt that any permanent staff would need to be tested regularly, by exercises as well as by actual incidents, in order to ensure that staff knowledge and operational experience is kept current.

An organisation not dissimilar to this, called the Gold Standard Reference Group (GSRG), was initially suggested as part of the service delivered via Gold Standard by the private sector company awarded the contract to deliver the training package, but the suggestion was not taken forward. During the training and exercising phase, GSRG staff would have provided exercise controllers, who would act as advisers during a real time event. This idea is currently being revisited by the CCS and the Emergency Planning College; the introduction of such a group should be supported.

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A single government agency may improve things during emergencies but it would not improve normal work for most organisations ... More power to the CCS and LRFs to ensure that arrangements are in place across government and across responder agencies would be a better way forward.

Category 1 Local Authority Responder

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Respondents felt that there is no automatic need for a permanent national co-ordination centre to be located in London. In fact, it was felt that it might be better located elsewhere due to the risks associated with the capital. Others felt that there was no need for it to be tied to a single geographic location and that it might be better as a 'concept' that could operate out of any one of several regional centres, such as the FRS National Coordination Centre in West Yorkshire, the Tri-service Centre at Quedgely, Gloucestershire, or a training suite at the Emergency Planning College, all of which could 'step up' to fill the role as and when needed. This would ensure that such a centre could be created with little additional cost, and would also provide added value to existing facilities that currently have some spare capacity. A series of potential operations centres around the country, owned by different agencies, might in themselves help to drive interoperability, as all systems feeding into these national co-ordination centres would need to be able to integrate with them and the centre, in turn, would need to integrate with the regional and local command centres of their own organisations.

Should such an operations centre exist, it was felt that its staff should be independent of any one emergency service or C1 responder (perhaps employed by the Cabinet Office, CCS or the Emergency Planning College), but be drawn from those organisations, possibly on fixed-term mid-career secondments.<sup>24</sup> Their duties might include:

- Being present each time the centre was operational during planned events and emergencies as well as during training scenarios

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<sup>24</sup> Mid-career was felt to be important as many respondents feel that operational knowledge is soon lost after retirement.

- Identifying experienced tacticians to advise during incidents. It was felt that it would be better to have a large pool of specialists on call, rather than a small pool of permanent staff, who could be called in according to the nature of the incident
- Providing support to commanders working outside their usual experience (for instance, experience of co-ordinating flood response to a region that has not experienced flooding before)
- Co-ordination of mutual aid requests and deployment of national assets, particularly across organisations and between the emergency services, volunteer agencies and the private sector
- Operating twin-tracked lines of communication for operational decisions and policy decisions to and from COBR and regional Gold Commands
- Analysing and capturing situational awareness and intelligence in order to build a common operating picture that could be used to brief COBR and Gold(s)

Respondents felt that it was important to focus on the human factors: technology solutions need to suck in data, but there also needs to be trained and experienced analysts who can look at all the information coming in and turn it into a clear brief that enables command decisions. (A concern raised about the National Resilience Extranet was that it does not have this human element.) Information and intelligence needs to be handled and disseminated

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A national emergency management agency, which can draw upon national assets, i.e. military resources, people, equipment etc and that sets the agenda for personal competencies, organisational competencies and capabilities, and trains exercises and audits them would be fantastic and would be a leader in civil protection.

Category 2 Transport Responder

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so that it makes sense to the people who receive it. A national operations centre might bring with it a greater incentive for all agencies to comply with national operating doctrine and standards.

In terms of existing models that could be copied or adapted by the UK, US State Emergency Operations Centers and US Fusion Centers were suggested; the latter in particular was offered as a good example of where large-scale emergencies become 'business as usual, scaled up'. The FRS National Flood Coordination Centre used during the 2007 summer floods, which operated out of Hereford and Worcester FRS headquarters, was also considered to be an example of where centralised co-ordination of resources has worked well. The Dutch system, which is very similar to the UK in terms of a structure of Bronze/Silver/Gold command, but which has a National Operations Centre, was also mentioned. In terms of the way mutual aid requests are co-ordinated, the European Commission's MIC (Monitoring and Information Centre) in Brussels was also widely praised.

### **Recommendation 8**

A National Operations Centre (or a series of National Operations Centre Facilities) could co-ordinate the response to a major incident and manage the logistics of the response. This should be considered as a legacy use for the National Olympics Coordination Centre. Command decisions, however, must remain at the local level.

#### 4. Central Resilience Budget and National Procurement Programme

The quantitative research phase returned the following results on support for a central resilience budget:

Advantage	Disadvantage	Don't Know
63.5%	19%	17.5%

The quantitative research phase returned the following results on support for a national procurement programme:

Advantage	Disadvantage	Don't Know
69%	13.5%	17.5%

In general, respondents felt that the lack of central budgets for national resilience activities, including procurement of interoperable equipment and attendance of multi-agency exercises, inhibits cross-agency and cross-regional working.

It was remarked on a number of occasions that as the money is ultimately all from the public purse, just different parts of it, there should be a way to manage budgets more centrally and effectively. Interviewees were not necessarily asking for more money, just for the money available to them to be administered differently. They accepted that centralised provision of equipment, systems or resources may bring with it a reduction in their personal budgets, but they did not object to this.

One example given of fragmented funding budgets causing problems was where one agency (such as a fire service) puts on a CBRN exercise, and invites others, such as a local ambulance service to take part. In such cases, it is often questioned why the other agency is not contributing more towards the cost of the exercise, though running it without them would provide little real benefit or understanding of how an actual event would unfold. This often makes inter-agency exercises politically difficult to administer and also means that exercises may be

duplicated because it is easier, though more costly to the taxpayer, for each agency to run its own. Such politics might be removed if exercises were administered and funded centrally, ideally by the Cabinet Office through the Emergency Planning College and Gold Standard.

Many interviewees feel that central resilience funding would also improve take-up of opt-in technology such as the Airwave network and the National Resilience Extranet, and ensure national standards; and that national procurement would lead to better deals on unit price and greater compatibility.

The eternal struggle between public interest (what is the best equipment) versus commercial imperative (what can realistically be afforded) was acknowledged and it was considered that strong thought leadership is needed to help to find the middle ground, driven perhaps through the Emergency Planning College or independent academic research. At present, there is no easy mechanism for measuring this.

Concerns over budget cuts or restrictions due to the current economic climate would appear to be a potential driver for encouraging a more joined-up approach to some activities in the future, as organisations will have to look for ways to use increasingly limited funds and resources more efficiently. Many responders felt that this could be an advantage, forcing their own organisation and others to look realistically at what capabilities can be shared, and forcing more joint-working and co-operation. It may soon be the case that responder agencies cannot afford not to work with one another.

Some respondents felt that there is not enough understanding of the relationship between efficiency and productivity in emergency management, and that more research in this area could also help to drive efficiencies. More centralised support is seen as a way to drive efficiency and to ensure the best use of limited resources. It is also felt that because funding is tied to individual agencies and regions, it is difficult to spend it on large-scale joined-up projects even though this offers huge opportunities for cost reduction.

**Recommendation 9**

A national resilience budget and a national procurement programme should be provided and administered centrally, to drive financial efficiency and technological standardisation. If additional funding cannot be found, the money made available for such developments may have to be reallocated from existing budgets.

**5. National Training and Exercising Programmes**

The quantitative research phase returned the following results on support for national training courses:

Advantage	Disadvantage	Don't Know
88%	3%	9%

The quantitative research phase returned the following results on support for a national exercising agency:

Advantage	Disadvantage	Don't Know
67%	14.5%	18.5%

Training and exercising was identified during the qualitative interviews as a way of enabling organisations to work together, of understanding and driving common operating procedures, and of assessing capabilities.

There was strong feeling that at present, training and exercising is too fragmented with little standardisation of course content, qualifications or learning outcomes. This was also considered to be problematic between regional forces of the same responder organisation. As a result, during multiagency exercises it is often difficult for responders from different agencies to easily assess one another's capabilities or understanding of a situation.

There is also no strong framework for recording lessons identified, acting on them, and using them to inform future training. Many respondents referred to exercises (both multi-agency and within their own organisations) in which the same

problems were repeated again and again because no assessment had been made of the outcomes of the previous exercise. There is often no real opportunity to identify learning points and to address them before future exercises.

There was general support for programmes such as Gold Standard, which have sought to create a single approach to exercising, and also to the idea of the Emergency Planning College. However, in both cases there was frustration that the 'opt-in' system does not ensure participation. As a result many stakeholders chose alternatives. In some cases this was because other options were considered to be 'better' (because they were cheaper) or some organisations had legacy options they were reluctant to give up.

Many respondents, regardless of their opinion of Gold Standard and the Emergency Planning College overall, felt that if the government was going to identify and develop programmes such as these, then using them should be mandatory or, at the very least, there should be some kind of accreditation system which assured that other options were offering the same syllabus. Under such an accreditation system, for example, there could be a core syllabus for a Gold Commander Course, which would be rubber-stamped by the Emergency Planning College, but which could be delivered at a number of local colleges such as the Fire Service College in Moreton-in-Marsh, the Police Staff College at Bramshill, or even accredited universities.

The important factor would be that everyone who had taken an accredited course would have followed broadly the same core syllabus, and would have achieved the same standard as everyone else. Such a system was likened to accreditation systems of professional organisations, such as

the Engineering Council, and university courses that satisfy the conditions for chartered status of the profession. This could be a future role for the Emergency Planning Society, which is currently working towards chartered status in conjunction with the Emergency Planning College and the Skills for Justice National Occupational Standards programme. In general, the ‘professionalisation’ of emergency management is seen as a positive development.

There is a need to explore the role of training and exercising more extensively.<sup>25</sup> In particular, research participants felt that there needs to be a better understanding of the distinction and overlap between academic study of emergency management and practical instruction. If, as seems to be generally thought, the Emergency Planning College represents the ‘university’ of the sector, where the focus is on high-level thinking and strategic leadership, while the practical, ‘polytechnic/vocational’ aspect of training is carried out elsewhere, such as at the Fire Service College, this relationship needs to be better defined.

It was also acknowledged that beyond a ‘core curriculum’ there would always be specialisations unique to each responder agency. These were seen

as an add-on to a shared core course, however, rather than the starting point.

The research also suggests that there is a good case for accrediting and standardising qualifications at a more grass-roots level. For instance, the multi-agency training delivered by the Emergency Planning College and Gold Standard is at the strategic, senior manager/commander level. If this was formalised by national qualifications, it would be at degree level or National Vocational Qualification (NVQ) Level 5.

There was some feeling that training at a level similar to NVQ Levels 1-3 (equivalent, in academic terms to GCSEs and A-levels) should also be accredited to accepted national standards so that organisations understand immediately what level of knowledge and understanding of certain equipment and standards one another has. Examples where this would be seen as advantageous included inland water rescue, use of Airwave, mapping and geographic information system capability, and mass decontamination for CBRN and hazardous materials. In general, it was felt that accrediting such qualifications should be a role for the Emergency Planning College, tied to a nationally recognised qualifications authority such as EdExcel or City & Guilds.<sup>26</sup>

## Recommendation 10

National training courses, qualifications and exercise programmes and testing programmes should be introduced to ensure standardisation and easy comparison of skills and capabilities between different agencies. This work should be led by the Emergency Planning College.

## Recommendation 11

More research is needed into the role of training and exercising as drivers of interoperability, and the relationship between academic study and vocational training in multi-agency interoperability.

<sup>25</sup> At the request of the Civil Contingencies Secretariat, a number of specific questions relating to training and exercising were asked during the quantitative survey, particularly in regard to opinions of the training offered by the Emergency Planning College. This data has been gathered and is awaiting suitable arrangements for its analysis and dissemination.

<sup>26</sup> Edexcel, ‘Providing Internationally Recognised Qualifications’, <<http://www.edexcel.com>>; City and Guilds, ‘Skills for a Brighter Future’, <<http://www.cityandguilds.com>>.

**6. National Statutory Guidance and Legal Mandates**

The quantitative research phase returned the following results on support for national statutory guidelines:

Advantage	Disadvantage	Don't Know
71%	9%	20%

The quantitative research phase returned the following results for more legal mandates:

Advantage	Disadvantage	Don't Know
32%	26%	42%

It was strongly felt amongst most interviewees that national guidance on interoperability, be this on operational procedures, use of specific technology such as the Airwave network, or capability assessments done through LRFs, needs

to mandated. There needs to be a system by which to check compliance, and there should be penalties for non-compliance. An example given was the recent NPIA Guidance on Multi-Agency Interoperability; this is welcomed and will go a long way to improving the situation. Many interviewees thought that such guidance should be statutory.

All interviewees felt that unless decisions on national systems and procedures are mandated, they will never be adopted universally. There should be no 'opt out' or voluntary take-up. An accreditation process is needed for agencies; national standards and credentials are needed for individuals.

There was some concern that such mandates could lead to 'box-ticking' without any real competence, or place additional burdens on regulators (with no clear indication of who the regulating agency should be, though the lead contender would be Gold Standard), but this was accepted as better than nothing, which is generally considered to be the situation at present.

**Recommendation 12**

Statutory guidance and mandated compliance is needed to ensure that policy set by central government is acted upon, operational procedures are followed and technology is taken up. Penalties should be imposed for non-compliance.

### **Box 3: The Fire and Rescue Service National Resilience Assurance Team – A Model for National Resilience for All?**

In recent years, significant work has been carried out to improve national standardisation and co-ordination between the regional fire and rescue services without impinging on the independence of each local service. The way in which this has been done would work well as a foundation model for national resilience.

Specific examples within this include:

#### *New Dimension*

The New Dimension programme was established following 9/11 to enhance the capability of the Fire and Rescue Service to respond to a range of incidents. It provides regional fire and rescue services with nationally standardised equipment, procedures and training to deal with threats and hazards such as CBRN attacks, industrial accidents, collapsed buildings and natural disasters. Part of its remit is to ensure that the FRS response is joined up with other agencies such as the police, ambulance services, local authorities and central government departments. Importantly, it ensures that capabilities that do not need to be held by every regional FRS are not unnecessarily duplicated, but can be made easily available to those regions that do not hold their own when necessary. For instance, there are twenty-one urban search and rescue teams in England and Wales, shared between forty-seven fire and rescue services.<sup>27</sup>

#### *National Resilience Assurance Team (NRAT)*

The NRAT is a team of more than twenty personnel, fully funded by the DCLG but responsible to CFOA, which supports FRS national capabilities, including the administration of the New Dimension programme. The NRAT sets common and consistent standards throughout the country on such things as training, logistics, operational practices, vehicles and equipment. Its offices are located on the same site as the Fire Service College at Moreton-in-Marsh, Gloucestershire.

The NRAT team also supported the work of the Office of the Chief Fire and Rescue Advisor in developing the National Co-ordination Advisory Framework (NCAF), which will be discussed further in Chapter 6.

#### *Fire and Rescue Service National Coordination Centre (FRSNCC)*

The role of the FRSNCC, located just outside Bradford in West Yorkshire, is to co-ordinate national and cross-regional mobilisation and deployment of all FRS resources in response to a major incident. It works in conjunction with the Communities and Local Government Emergency Room in London – when this has been activated – and provides national co-ordination for the control room staff in the FRS, that has requested national or cross-regional assets and those from which the assets are being deployed. This includes the national assets that come under the New Dimension programme administered by NRAT, as well as conventional FRS resources.<sup>28</sup>

#### *Firebuy*

Firebuy<sup>29</sup> acts as a central procurement body for the FRS, providing framework agreements that deliver a standardised product range contributing to national resilience along with opportunities to share resources. It was established in 2006 to drive the National Procurement Strategy forward, to negotiate call-off contracts for Fire and Rescue Authorities, and take the lead in contract management. It also takes a lead in testing and acceptance activities. It enables the procurement of standardised vehicles, flood and water rescue equipment, communications equipment, protective clothing, and training, amongst other resources. It is a non-departmental public body, but works closely with CFOA, DCLG, regional FRS management boards and the National Procurement Board.

*This report sees no reason why these programmes could not be mirrored within other Category 1 responders, or expanded to include them, becoming genuine National Resilience Assurance, not just national resilience for the Fire and Rescue Service.*

<sup>27</sup> Fire and Rescue Service, 'National Resilience Aide Memoire', *NCAF Support Handbook* (Version 1.0, January 2010).

<sup>28</sup> Taken from Fire and Rescue Service circulars distributed in 2008.

<sup>29</sup> Firebuy, <<http://www.firebuy.gov.uk/about-firebuy/history.aspx>>, accessed 22 April 2010.

## 5. Strength in Diversity

### Key Research Finding 3: Differences must be recognised and understood

Interoperability solutions tend to look for a single solution and assume that all responders can and should adapt to fit a single model. However, a one-size-fits-all solution may be neither practical nor possible for some aspects of multi-agency working. Ensuring flexibility in operating procedures and systems integration rather than single systems for technology solutions is essential. The impact of genuine differences on the ability of agencies to work together, and consequently how these can be overcome, is not sufficiently understood at present.

Virtually all of the individuals and organisations interviewed during the qualitative research agreed that interoperability depends on three separate but connected elements: people, processes and systems, and technology. Unless all three factors are considered, true interoperability cannot and will not be achieved.

For interoperability to succeed, it needs all partner organisations to work together. At present, however, interoperability is not considered to be a 'parliament of equals'. Some initiatives focus only on tri-service working between the three blue-light services (fire, police and ambulance); some between all Category 1 responders, including local and national government agencies as well as the blue-lights; and some reach more widely, including Category 2 responders and others such as volunteers and third sector responders. As a result, some enablers work well across all responder agencies, others are more problematic.

This research project was concerned with interoperability between the agencies involved in the response to a threat or hazard on the National

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'One size fits all' – but what if it doesn't?

Private sector ICT contractor

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Risk Register. This includes not only Category 1 and 2 responders as defined by the Civil Contingencies Act 2004 but also the organisations that support them in that response, including those from the voluntary sector, NGOs, the private sector and from self-helpers in the affected communities. The voluntary sector can be defined as national organisations who have pre-determined arrangements with the emergency services, such as those listed in the LESLP Major Incident Procedure Manual,<sup>30</sup> including the British Red Cross Society and the Salvation Army. Any event will also inevitably include local community groups that are specific to the area affected by a particular incident and many organisations whose involvement will not have been predicted in advance.

The complexity of this community is illustrated by the number of organisations that contributed to the Pitt Review into the 2007 summer floods, which included:<sup>31</sup>

- 28 Emergency service organisations (fire, police, ambulance)
- 28 Community groups
- 13 Voluntary organisations
- 86 Local government organisations
- 32 Utilities and critical infrastructure providers
- 33 Central government departments and agencies
- 10 Regional government offices
- 43 Local Resilience Forums.

The sheer diversity of organisations that may need to interoperate is also demonstrated by the many different incidents, operations and events that it was suggested should be considered as case studies during the scope of this research (see Box 1, p. 6). It has not been within the scope of

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<sup>30</sup> London Emergency Services Liaison Panel, 'Major Incident Procedure Manual', <[http://www.leslp.gov.uk/docs/Major\\_incident\\_procedure\\_manual\\_7th\\_ed.pdf](http://www.leslp.gov.uk/docs/Major_incident_procedure_manual_7th_ed.pdf)>, accessed 10 June 2010.

<sup>31</sup> Cabinet Office, *op. cit.* in note 15.

this research to look at the response to all these incidents, or indeed the exact contribution made by every potential responder organisation, but their range alone helps to illustrate the challenges inherent in ensuring interoperability.

The emergency management landscape is complex and wide-ranging, and a full understanding of who

is involved, in what circumstances and in what way, is vital. Interoperability relies on 'the right people being able to communicate with the right people', as one interviewee put it. More research and analysis is needed into the social science of interoperability, and this is where the main effort (and funding) needs to be focused in the immediate future.

### Recommendation 13

A full understanding of the emergency management landscape, including exactly who is involved, in what circumstances and in what way, is vital. The picture is complex and wide-ranging and not enough research and analysis has been done so far into the social science of interoperability. This is where efforts (and funding) need to be focused in the immediate future. Central government should earmark funding for social science research on the human factors required to enable interoperability and make this a priority over funding for technical solutions.

### Equal Engagement with All End-Users

At present, many end-users feel that interoperability projects focus too much on technological solutions, without fully understanding the human factors and organisational processes that ensure these technological solutions will be adopted and used effectively. All respondents saw the need for technological interoperability, but equally all agreed that form must follow function. What the technology enables you to do is more important than how. Respondents also raised concerns that technologies such as the Airwave network and the National Resilience Extranet are often dealt with in isolation, rather than as part of a single communications system able to integrate across its component parts.

Respondents from outside the blue-light services often felt that their own needs are not fully considered when interoperability is being discussed, and that instead they are expected to fit into frameworks that meet the needs of the blue-light services, but work less well for local authorities and government agencies, or for voluntary agencies that provide vital surge capacity. Responders from these organisations frequently felt as if they were 'second-class citizens' whose opinions were given insufficient weight during multi-agency training and exercising or on joint forums.

This pointed to poor engagement with the entire spectrum of end-users, in particular with the correct end-users, at the beginning of projects to improve interoperability. This was felt to be a particular problem during the research and development phases of technology projects.

A blue-light focused approach risks developing operating procedures or technologies that do not suit the needs of the entire emergency management community. In the case of technological solutions in particular, it risks developing technology that some sectors cannot afford; which cannot be integrated with other systems that provide essential capabilities to one responder agency but which others have no need for; or with existing systems that cannot be switched off overnight and may need to be used alongside joint systems, at least in the short term. There is little point in developing a solution that suits one organisation perfectly but which is difficult for others to implement and operate. Many responders felt that such mistakes have often been made in the past.

It is important to stress that the broad feeling is that interoperability has improved significantly in recent years, particularly amongst the three blue-light services (fire, police and ambulance), and

continues to improve further, as demonstrated in Chapter 3. During the period of this research, Rob Walley, at the time civil protection manager for Brent Council and Co-chair of the Multi Agency Airwave User Group, moved to the NPIA interoperability programme as a subject matter expert for Local Authority and wider responder community engagement, sitting alongside police, ambulance and fire service subject matter experts. Such developments are positive and should be both encouraged and supported. There is still, however, a feeling that the interoperability net is not being cast wide enough and that not all players are always considered to be equal partners.

### **Emergency Planning, Emergency Response: The Holistic Approach?**

The quantitative research phase canvassed opinion on which specific responder agencies need to be more joined up in future.

In particular, there is perceived to be a gap between the blue-light services and local authorities, often described by interviewees as the 'emergency planning' and 'emergency response' sides of the emergency management spectrum.

There is a broad feeling that there needs to be more consideration of how emergency management is tackled holistically. Indeed, is the very fact that the differences between emergency planners and emergency responders are insufficiently acknowledged part of the challenge?

'One size fits all' solutions to interoperability enablers (in terms of both technology and operational procedures) may not consider that different responder agencies have genuinely different needs, both in their day-to-day operations and also during multi-agency responses. Examples of this are given below.

This inequality of engagement would appear to be at least partly due to incomplete understanding of the needs of each responder organisation and could be improved by initiatives that would enable different responders not only to train and exercise together but to learn about how each of the others

operates, including the skills and equipment they have (and, just as importantly, do not have), their operational and management structures, their roles during the response, and their place in the wider picture. Organisations that better understand one another will be able to work together more easily. Ways in which this understanding might be improved are explored in Chapter 6.

### **Organisational Impediments to the 'One Size Fits All' Model**

A number of examples were given by respondents during the qualitative and quantitative research phases that illustrated genuine differences between their organisation and others that made a 'one size fits all' solution difficult if not impossible. These included, but were by no means restricted to:

#### *1. Responsibility Priorities*

There are significant differences between organisations whose core business is emergency response (primarily the blue-light services) and those who have a role during emergency response but whose day-to-day core business is more wide-ranging, such as local authorities. Differences mentioned here included the ability to maintain twenty-four hour working patterns; familiarity with complex communications technology that might be used every day by the blue-light services but only infrequently by local authority staff; whether the organisation has dedicated emergency management staff, how many, and how much of their time can be dedicated to planning meetings and training exercises; and what proportion of the organisation's overall budget or time is given to emergency management.

For instance, a C2 responder in a utility company may only have one emergency manager, who may also be the business continuity manager and hold additional responsibilities. The responder may be required to be his company's representative over an area covered by several LRFs, each of which run their own exercises and events, and he simply may not have time to attend everything. A possible solution to this might be to rotate his attendance at different LRFs (so that over the course of two

or three years he has attended each one at least once), with each LRF providing minutes of meetings he does not attend.<sup>33</sup>

Solutions such as this do not seem to be given much consideration at present, and instead there is a tendency to accuse some responders of not wanting to engage fully, whereas in reality there may be genuine barriers to them doing so.

### Recommendation 14

It should not be assumed that all responder organisations can fit a standard model. Interoperability models must be flexible and respect organisational differences. Where it is genuinely difficult for an organisation to modify its operations to fit the general model, alternative ways of integrating that agency should be explored.

#### 2. *Relative Seniority*

The relative seniority of the person each agency sends to multi-agency groups such as LRFs, and to events such as exercises, can impact on how effective they are and how much weight their input has.

Some respondents from local authorities felt that they were often treated as the poor relations at LRFs as they are generally middle managers, at a level that is relatively junior in comparison to the chief constable or chief fire officer from the blue-light services. An equivalent management level would be the chief executive of the local council, but such

a person rarely attends as the role is designated to the Emergency Planning Officer (EPO). This has consequences during the response to an actual incident, as the chief executive may not understand what is required of him, whereas the EPO who does is not senior enough to make the decisions needed. One solution to this is that during the response to an actual event, the chief executive and the EPO may both need to be present in Gold Command – the former to make the decisions, and the latter to act as an adviser, informing the command decision. Problems such as these, and potential solutions, need to be understood and addressed in advance of an actual event.

### Recommendation 15

Multi-agency working should consider the relative seniority of representatives to the group and the impact this will have on their ability to make decisions for their agency during an actual event. In some cases, the usual representative may need to be the adviser, not the commander, during the actual incident. This relationship needs to be understood and planned in advance of an event.

#### 3. *Level of Security Clearance*

The level of security clearance emergency responders need to hold was often cited as problematic. Police officers, and other agencies routinely involved in handling sensitive information, are routinely security checked to the level SC (Security Check), which allows routine and uncontrolled access to

material marked 'Secret' and supervised access to 'Top Secret' material. However, most firefighters, ambulance staff and local authority emergency planners do not undergo security checks routinely as a condition of their employment. Respondents who were from organisations where security clearance is not routine felt that it is often insisted upon during

<sup>32</sup> The Ambulance Service has twelve NHS Ambulance Trusts in England, each of which can cover up to five LRF areas, and so experience similar challenges.

multi-agency working by the police when there is no real need for it. This can have the effect of preventing emergency planners from having access to useful and sometimes vital information.

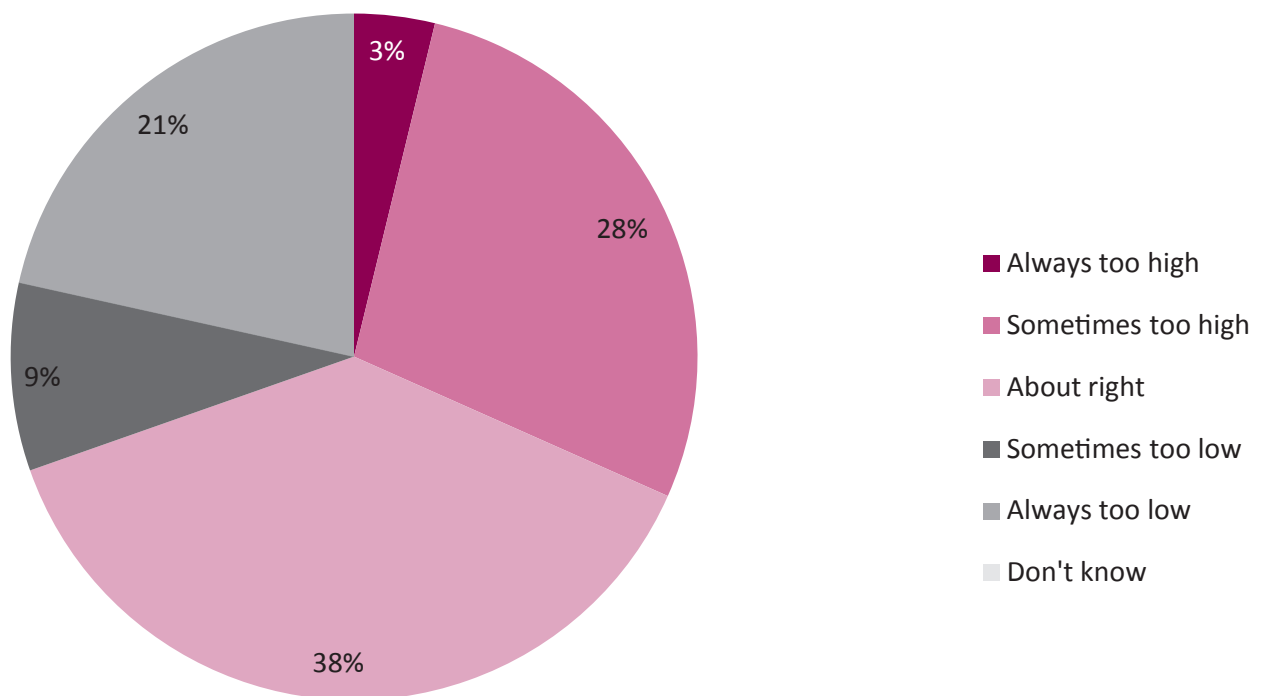
In particular, access to information on critical national infrastructure sites and threats to CNI – particularly that passed out by the Centre for the Protection of National Infrastructure – was not considered to be shared as widely as it might be between all the people who needed to see it. The disadvantage this could cause was, for example, not being able to plan the placement of limited flood defences because it was not known whether one electricity substation was strategically more important than another.

Some initiatives have been developed to address this, such as the work done by Staffordshire Civil

Contingencies Unit<sup>33</sup> to ensure all members of the Regional Resilience Forum are security checked and so can access information easily. This is not, however, standardised nationally.

It is important to note that some police respondents, when this issue was raised, were genuinely unaware how few firefighters, ambulance staff and other C1 and C2 responders are routinely security checked, and were somewhat surprised to find that the majority are not. The police may sometimes set a security at a level they see as 'normal', without considering the effect this has on other responders whose organisations are not so security-focused. This can be perceived as an attempt to deliberately exclude some agencies, but is more likely to be due to misunderstanding other agencies' different levels of security clearance.

**Graph 9:** The security of communications during multi-agency operations.



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<sup>33</sup> Andy Marshall, 'Clearing the way: Civil Contingencies and National Security', *RUSI National Security and Resilience Monitor* (Vol.8, No.1, January 2009), pp. 8–9.

The quantitative survey questioned the level of security currently observed during multi-agency operations. One respondent remarked that once an operation is underway, the security issue should be secondary to getting the job done and the information released 'for the greater good' where necessary. It was generally agreed that the urgency of sharing information needs to, in the words of one responder, 'trump security barriers'. Lack of

consistency, and lack of understanding of security classifications, as well as lack of understanding of how insecure the mobile phone network can be, for example, were all raised as issues. One respondent made the valid point that the question was unanswerable as it had been posed, as 'security levels depend on the content of the messages, the context and the audience'.

### Recommendation 16

More work needs to be done to understand the use of security classification during multi-agency working, including whether high security levels are strictly necessary, or whether there are situations in which some security classification might be flexible.

#### 4. Budgets

Differing budgets and ways of administering those budgets between different organisations will have an effect on how they are able to interact with other agencies in terms of time, equipment, personnel and resources. There is no point in insisting on a single system or piece of technology that not everyone can afford, or justify affording, when something cheaper is seen to do the job adequately. In this regard, it is important to ensure that legacy systems from less well-off responder agencies and volunteers are not prevented from integrating with expensive, hi-tech networks professional responders both use and can afford.

Budget constraints can affect the security of operations. For example, because there is a set charge for a National Resilience Extranet licence regardless of the type of organisation buying the

licence, some organisations may buy one licence and share log-in information, thus potentially compromising security. One licence but multiple user log-ins might be a solution to this.

Some participants in the survey from volunteer agencies stated that the demise of analogue communications and the high cost of digital services made it difficult for them to communicate with the professionals over official networks. As a result, they are now more likely to resort to 'ordinary' and insecure channels of communication such as mobile phones than has been the case in the past.

National resilience budgets, and national budgets for training and exercising, as discussed in Chapter 4, page 21, were seen as a solution to this, especially if agencies that needed the equipment could be 'given' it, rather than have to pay for it.

### Recommendation 17

Multi-agency working must consider the budgets available to all responders and be wary of making participation dependent on expensive technology or equipment that not all agencies can afford.

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The ability to create communication groups and structures is as important as the kit on which those involved then communicate.

MoD Responder

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### *5. Pace of Technological Change*

Many respondents referred to the fact that twenty-first century technology is developing at an incredible pace and changing so quickly that it is unrealistic to expect public sector development and procurement to keep up with commercial, off-the-shelf developments, particularly with regard to communications technology. It is also unrealistic to expect all sectors of the emergency management community to keep up with one another at the same pace or with the same budget.

Public sector ICT systems may seem somewhat old-fashioned and 'clunky' compared to commercial off-the-shelf technology, yet this may be inevitable in order to enable appropriate security and resilience. At the same time, however, the technological expectations of young recruits into the emergency services means that if a video can be sent by mobile phone, but not over official systems, they will probably send it by mobile phone regardless of the lack of security. Personal communication devices, such as Blackberries and mobile phones may be used alongside Airwave service handsets and the National Resilience Extranet during the same operation.

As new systems are introduced, they must be able to 'crossover' with existing legacy systems and with other communications systems, as systems may not be able to be rolled out all at once across

all agencies. In this respect, systems integration rather than a single system is vital to ensure future interoperability.

This would seem to contradict the third recommendation made in the original RUSI report 'Communications Inter-operability in a Crisis', which stated:

It is therefore recommended that multi-agency information flow requirements are defined so that the platform on which the information systems are to operate is designed for purpose – rather than the system being designed to fit the platform on which they have to operate.

Systems integration, which would enable the use of multiple platforms, is more advanced now than it was at the time of the original report. Technology has moved on a great deal in the last five years alone. With this in mind, future interoperability planning should aim for systems integration more than a single system or a single platform, to ensure that all agencies can 'plug and play' into a central trunk system designed for the emergency services or C1 and C2 responders more widely.

The Airwave network and the National Resilience Extranet need to form the backbone of this, and to be fully able to integrate with one another, but they also need to be careful not to lock out other systems used by responder agencies and others involved in the response. In particular, it is vital that the Airwave network and the Extranet are seen as parts of a greater whole, not two separate systems, and are managed holistically as such by one responsible owner. The reasons for this will be explained in more detail in Chapter 6.

### **Recommendation 18**

In future, systems integration is likely to be more important to communications during multi-agency operations than the use of a single communications system. Communications integration needs to acknowledge that agencies will use legacy systems alongside new developments; surge capacity may be provided by organisations not operating on official systems; and responders will use personal communications equipment alongside secure networks. The implications for operations need to be fully understood.

### 6. Deployment to Incident Scene

The way in which responders arrive at an incident scene (and if, in fact, they need to arrive at all) has implications for interoperability in terms of access to equipment and command structures in particular.

The communications systems responders use is just one example of this, but it serves to illustrate some of the issues. Police officers, who tend to operate largely on foot or in cars, are limited in what equipment they can carry. Their primary communication system needs to be a small, handheld set with a relatively long battery life. Firefighters and ambulance paramedics, who are deployed in larger vehicles, can afford to have larger, heavier communication devices with large display screens. Ambulance crews in particular use far less voice communication than the police. The impact of these differences on multi-agency operations needs to be explored more than is understood at present.

Respondents from both the police and fire service raised the issue that the Bronze/Silver/Gold system was sometimes difficult as the Fire Silver Commander tends to be located at the scene, whereas the Police Silver tends to be located off-site at a police station, which makes interoperability at the silver level problematic. There appeared

to be a tendency from both sides to feel that the other should change to 'fit in'. There are, however, very good reasons why the respective service's silver commanders are located in this way: the fire service have specialised command support vehicles which provide, essentially, a mobile office environment that enables on-site command, and firefighters tend to work in larger teams, making it more appropriate for a silver commander to be co-located with his 'troops'. Police, on the other hand, tend to arrive at the incident in smaller vehicles, with less equipment, and in smaller numbers. During routine operations it may be therefore completely appropriate for the fire service that the fire silver commander is located at the scene, and completely appropriate for the police that the police silver commander is located away from the scene. What does not appear to be happening at present is genuine discussion about how these differences could be respected and overcome such as, for example, a video link between silver commanders that removes the need for them to be physically co-located.<sup>34</sup>

Such differences become even more apparent the wider the responder net is cast. Local authority liaison officers may not need to be at the scene or silver command at all. These relationships need further investigation.

### Recommendation 19

Where commanders from different organisations are located at the time of the incident, and how they arrive at the incident scene (if, indeed, they need to be there) needs to be better understood so that differences can be worked through and solutions identified. It may not be possible for some organisations to modify their operational procedures to fit a standard model.

<sup>34</sup> Some regions have been carrying out work to address this, such as through MARCUS in the West Midlands, but this has not been adopted nationally. Work being carried out by the Fire and Rescue Service on the use of multi-agency Strategic Holding Areas (SHAs), which would provide better co-ordination of responders at major incidents, including maintenance and replacement of equipment, welfare and communications, is aiming to address some of these issues.

## 6. Sharing Information

### Key Research Finding 4: The importance of disseminating and sharing information

Ironically, workstreams that aim to improve interoperability are themselves sometimes fragmented and siloed. Frameworks need to be put in place to ensure that separate work programmes, such as the those carried out by the Civil Contingencies Act Enhancement Programme, the NPIA Interoperability Programme and the FRS National Resilience Assurance Team are able to work together more closely to ensure that good practice from each one is cascaded through the others.

Throughout the research, discussions revealed that responders’ knowledge and awareness of advances in interoperability, changes to policy and operational procedures for multi-agency working, and multi-agency response frameworks is not always up to date.

During the qualitative phase, respondents often gave examples of how their organisation would be much more able to work with another if only the other organisation would change or modify its current practices. Where possible, these criticisms were checked back with the organisation against which they had been levelled and, in the majority of cases, it was found that while the issue had caused problems in the past, it had since been addressed or was in the process of being addressed.

However, such work may not be widely publicised, particularly if it is not yet complete, so that there is often a perception that barriers still exist long after they have been removed or are in the process of being removed. In such cases, the perception of

the barrier prevents efficient joint working just as much as if it actually existed.

Part of this is down to the lack of strong communication strategies to publicise changes and few checks on whether disseminated information is absorbed and acted on. For example, one respondent who had developed a CD-ROM training package to enhance interoperability within his own organisation admitted that while a large number of units had been distributed, he had no way of tracking whether the recipients had even taken the CD-ROM out of the envelope, let alone used it or acted on its contents. Therefore, its effect (if any) was impossible to gauge.

This suggests that there could be better channels for disseminating information on current interoperability programmes and policy. It should also be acknowledged, however, that this is another symptom of the lack of a real ‘top’ to emergency response management, meaning that while guidelines and policy can be issued, there may be no requirement to even read, let alone to implement, that guidance. This is especially true across organisations.

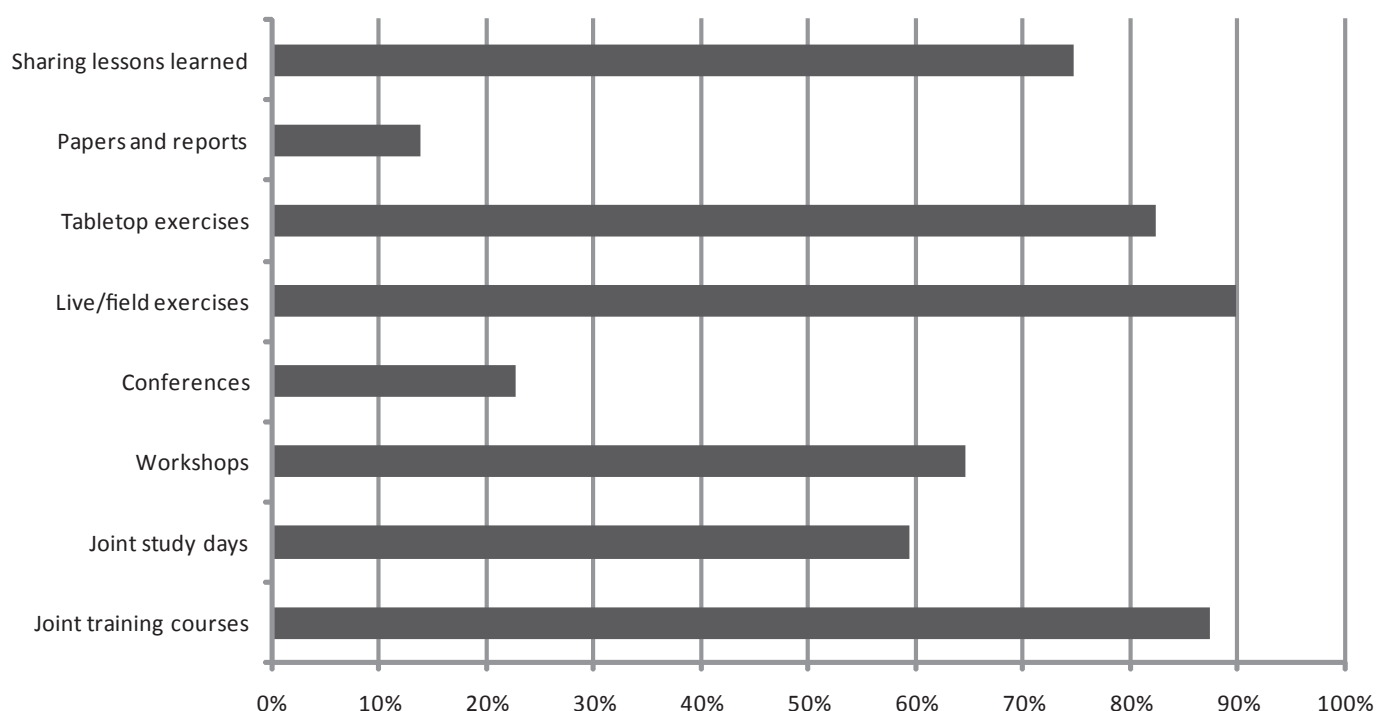
The current situation also runs the risk of unnecessary duplication, as agencies who feel their needs are not being considered may start working on their own solution, which they may be unwilling to abandon when a cross-agency solution, or a good solution developed by another agency, is announced.

Mandating compliance with interoperability guidelines may help to ensure that all responders are made aware of changes and advances.

### Recommendation 20

Information on changes and updates to existing procedures or practices needs to be pushed to those who need it, and mechanisms introduced to ensure that information is absorbed and acted on. Mandating compliance with certain interoperability guidance may help this and should be considered.

**Graph 10:** The most useful methods for understanding major incident interoperability.



**Facilitating Better Understanding**

The situation described above suggests that more work needs to be done to ensure that different responder organisations are kept up to date with changes made by the others, so that changes and improvements made by one can be implemented across the entire community.

The second, quantitative phase of the research canvassed opinion on how a better understanding of other agencies might be facilitated. The options given were based on suggestions that had been made during the qualitative interviews. The results are presented in Graph 10 .

The quantitative survey suggests that opportunities to train and exercise together (on joint training courses, in live field exercises and through tabletop scenarios) are considered to be the most effective ways of understanding how different organisations operate, followed by workshops and joint study days. Conferences, papers and reports were less popular.

*1. Training and Exercising*

<b>Live/field exercises</b>	<b>90%</b>
<b>Tabletop exercises</b>	<b>82%</b>

All opportunities for training and exercising scored highly, with live/field exercises (in which the participants recreate an emergency scenario such as a train crash or a CBRN attack and practice the response as if the incident was actually happening) scoring only slightly higher than the second-highest placed method, tabletop exercises (in which the participants talk though a scenario in the classroom). Comments made by respondents to the quantitative phase, as during the qualitative interviews, revealed that both forms of exercising are considered valuable for finding out what capabilities the other organisations do not have, as well as those they do, and for testing assumptions that one organisation may have about the resources or capabilities of the others. The two types of exercising were considered to have different strengths and weaknesses.

Respondents feel that live/field exercises provide opportunities to test equipment, including setting up, operating, and making sure it is compatible with equipment from other organisations. It was also acknowledged that on such exercises, the majority of the available time can sometimes be spent setting up and testing one's own equipment with relatively little time given to how the participants work together and how the event might unfold. It is important to separate the two aims, to provide time to talk through problems identified and to find potential solutions, and part of any exercise schedule should be set aside for this. This would in turn ensure that there is sufficient time available to recreate a sustained period of simulated incident, in which the ability to command and manage the event can be properly tested. Nonetheless, the popularity of training and exercising together as a driver for understanding how one another operates is a clear argument for supporting such events in future.

As discussed in Chapter 4 (p. 22), many respondents would like to see national training and exercising

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Understanding will increase if all new recruits to each service [fire, police and ambulance] start initial training together and specialise throughout training but also rotate for modules in other services to gain understanding, then exercise together.

Category 1 Blue Light Responder

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programmes introduced, for which participation is mandatory, with a national agency responsible for planning, running and assessing exercises. The role of Gold Standard, the Cabinet Office-sponsored strategic-level training system, is relevant here: the research revealed that it is not always clear whether Gold Standard is intended to be an exercise programme or an evaluation tool, and that these two functions need to be separated. It is important for participants to know when they are being trained and when they are being tested. The lack of clarity leads to a reluctance to use Gold Standard as doing so can open an organisation up to criticism if it falls short of expected capability. Gold Standard may be able to assess capabilities and also to build them, but it should not aim to do both at the same time.

### **Recommendation 21**

The popularity and effectiveness of joint training and exercising opportunities as a driver for understanding other organisations' needs and capabilities should be at the centre of future efforts to improve interoperability. New guidance, operational procedures and policy should be tested and exercised as both part of the process of development and of the implementation strategy.

### **Recommendation 22**

More research and evaluation needs to be carried out on the structure, use and role of Gold Standard and the Emergency Planning College in improving multi-agency interoperability and the understanding of capabilities across all C1 and C2 responders. In particular, the capabilities assessment role of Gold Standard and its use as a training programme need to be clearly delineated.

## 2. Joint Training Courses

Joint training courses	87%
Joint study days	59%

Joint training courses in which staff from all responder agencies train together on the same course and to the same syllabus has been discussed previously in Chapter 4, and was also seen as a major driver for understanding other agencies. Some respondents drew parallels with military basic training for recruits (whereby all recruits to the army undergo a similar initial training package before specialising to their particular unit, ensuring a core set of key skills that all share), military officer training at Sandhurst, and the joint services staff officer course at Camberley. The importance of the parallel is that knowledge of other services is embedded at the very beginning of a soldier's career, whereas within the emergency services it comes at a later stage, by which time preconceptions may be difficult to overcome and meaning that knowledge

of other services is only taught to commanders, not to everyone.

Possible solutions to this include the introduction of a shared training package for all emergency services recruits which could be included in the Public Services BTEC, or introduced as a module on all ambulance paramedic, police cadet and fire service cadet training, so that a period of the training courses would involve working jointly with cadets from the other services. This would need to be backed up by accredited qualifications and kept current through Continued Professional Development, overseen by the Emergency Planning College.

The more an understanding of multi-agency working, and the capabilities and roles of other responder agencies is bedded in at the very beginning of a responder's career, the easier it will be to keep them up-to-date and abreast of changes, particularly if these changes are continually introduced and practiced through regular opportunities for joint exercising.

### Recommendation 23

Joint training between responder agencies and shared modules as part of initial training for all responder agencies will help to embed a thorough understanding of multi-agency working at an early stage of responders' careers.

## 3. Information Sharing

Sharing lessons learned	74%
Workshops	65%
Conferences	23%
Papers and reports	14%

A number of respondents felt that at present, there is little opportunity to share identified lessons so that they can truly become lessons learned, which can then be used to improve future performance.

This was felt to be a problem within organisations as well as between them.

One reason suggested for this was that organisations and individuals are reluctant to admit to 'mistakes' or a perceived poor performance, and therefore reports and debriefs are not widely published or disseminated, nor discussed with other agencies. Making a clearer distinction between exercises that are intended to increase skills and experience (learning exercises) and those that are intended to demonstrate capabilities (testing exercises) would help this. As with the exercises themselves, the ability to come together and to discuss issues face-to-face in a two-way exchange of information, such

as interactive workshops, was preferred to one-way information flows in which the audience received information, such as at conferences or through papers and reports.

The National Resilience Extranet was suggested as a mechanism through which debriefs from previous exercises and identified lessons can be shared and built upon. This was seen as a key advantage of the Extranet that should be encouraged and supported.

Some respondents remarked that sharing experience and lessons identified is particularly important in multi-agency incidents as such events are rare, meaning that no individual, or even region, is likely to be an expert in dealing with that situation. Knowing where to turn for information on how a previous flood response was managed for example can therefore be difficult, and in some cases dependent on personal experience and contacts rather than official channels. Better ways to access subject matter experts and to capture experience should be explored in future.

### Recommendation 24

There needs to be a stronger framework for sharing information and lessons identified from actual events and exercises, so that responders can learn from previous experience.

#### Box 4: Good Practice – The NCAF

During the course of this research, the FRS National Coordination Advisory Framework (NCAF)<sup>35</sup> was cited by one chief fire officer as a good example of an effective driver for interoperability. The NCAF, developed by the Office of the Chief Fire and Rescue Advisor, outlines a framework for an enhanced level of support and provision for the FRS in responding to incidents that are of national significance or which require national co-ordination either within in the UK or to an overseas incident to which UK resources are being deployed.

The Framework was first used on FloodEx, an international flooding exercise held in the Netherlands

in September 2009. Several regional UK Fire and Rescue Services, the Royal Air Force and the Royal National Lifeboat Institution participated.

The document was officially published in September 2009 and should have been 'in the news' during the period of this research but was not mentioned by a single interviewee outside of the Fire and Rescue Service. Peter House of the FRS National Resilience Assurance Team picked up on this following a draft copy of the interim report, in which one of the key research findings was the need to ensure that information is passed outside organisations as well as distributed within them, and used this as an opportunity to spread awareness of the NCAF to the entire responder community.

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<sup>35</sup> For more information on NCAF, see <<http://www.communities.gov.uk/documents/fire/pdf/opguidancencnaf>>.

## 7. Beyond Communication

### Key Research Finding 5: Beyond the 'C' of ICT

Interoperability is dependent on social communications, not just communications technology. In the modern world, there are more ways to get the message through than there have ever been before. Knowing which one to use, in which situation, and ensuring that all possible platforms that are able to send and receive them are as interoperable as possible, is more realistic than relying on a single system.

This project started as a research programme into communications technology in general, and the role of the Airwave network in particular as a driver for interoperability. It would therefore be remiss not to spend some time addressing specific issues uncovered during the course of the research that relate directly to communication systems.

The slow take-up of the Airwave network by some responder agencies prior to 7 July 2005, the resistance to it from some quarters, and criticisms levelled at it during this research project (which were largely to do with the way it is used, not the technology itself) were symptoms of deeper problems, and not their cause.

In general, the Airwave network was felt to work well and to be generally fit for purpose: however, many responders outside of the police felt that when commissioned and developed, its purpose was to be a police radio, rather than a truly multi-agency platform that offers the best day-to-day use for all responder agencies. An important part of the research was finding out why this had been allowed to happen.

Criticisms levelled at the network could largely be traced back to technological specifications that had been bedded in at an early stage of the Home Office-

led Public Safety Radio Communications Project in the late 1990s, along with a failure to sufficiently future-scope the project and to anticipate the rapid improvement in mobile communications technology, meaning that the Airwave service handsets of 2010 lack the full functionality of, for instance, a Blackberry or an iPhone. As a public safety network it is resilient, it has good coverage, and it is secure. The network does, however, have limited spectrum capacity, tied to the TETRA network which limits the exchange of extensive video streaming and the use of other data capacity-hungry applications. For the non-police responder agencies, who rely on data more than on voice, this is a serious concern, particularly as opportunities to increase the data capacity of the network may soon become extremely limited.

By 2012, all analogue terrestrial television and radio networks in the UK will have been switched off and their services migrated to digital networks. This will result in the freeing up of large bands of radio spectrum capacity, some of which could be used to increase the capacity of the Airwave network. However, many responders fear that due to recommendations made in the 2005 Independent Audit of Spectrum Holdings led by Professor Martin Cave on behalf of the Chancellor of the Exchequer,<sup>36</sup> this additional spectrum will be auctioned off in an open market, in which the public sector will not be able to compete. If this happens, the opportunity to increase the data capacity of the Airwave network will be lost.<sup>37</sup>

In particular, many emergency service responders would like to see some of the spectrum that may be released and sold by the MoD as a result of its 2008 review on UK Defence Spectrum Management<sup>38</sup> to be transferred to the public safety sector at no cost, on the grounds that the value to society is worth more than the revenue that might be

<sup>36</sup> Spectrum Audit, <<http://www.spectrumaudit.org.uk>>; and Ofcom, <<http://www.ofcom.org.uk/consult/condocs/sfrps/summary>>.

<sup>37</sup> 'Airwave O2 Limited response to Ofcom's consultation on the Spectrum Framework Review', <<http://www.ofcom.org.uk/consult/condocs/sfrfp/sfrfp/responses/airwave.pdf>>.

gained from selling the spectrum concerned.<sup>39</sup> While this report agrees that these concerns are valid, for such a proposal to be seriously considered, it would need to be backed up with a robust and complete understanding of the current spectrum requirements of the emergency response community, how these will change in the near and long-term future, for what reason(s) additional spectrum is needed and, if available, what it would be used for.

Such an understanding is not mature enough at present. A complete review of spectrum use by the emergency services, similar to that carried out by the MoD, must be conducted for this issue to be understood and to enable the emergency services community to put forward a strong and valid business case for the reallocation of MoD spectrum to the public safety services. This review should focus not only on the economic and market aspects of spectrum availability, as the Cave report did, but on the responsibility of the government to protect its citizens. The spectrum that may be sold off has a value that can and should be measured in terms of human life and safety, not just in potential revenue generated.

Exactly who would carry out such a review and, in fact, if one is even possible, highlights perfectly the problems caused by the fragmentation of the public services sector. With no over-arching organisation like the MoD capable of carrying out or funding such a review, it is virtually impossible to conduct one. BAPCO has made some moves towards setting up a cross-agency forum in which the issue can be discussed and to act as a lobbying organisation, but what effect this will have is uncertain.

Additional spectrum is desired largely for communications uses that would have been hard to anticipate in the early days of the Public Safety Radio Communication Project. The Airwave

network was essentially envisaged as replacing the traditional hand-held 'walkie-talkie' police radio. It is much easier with hindsight to anticipate that a hand-held device in 2010 could be used to communicate not only voice and SMS text messages, but emails, photographs, recorded sound files and videos. Today's handsets can also access the internet and contain GPS technology. Moreover, it might not have been obvious that such technology would be available off-the-shelf at such an affordable price that most emergency responders would see it as a normal part of everyday life and everyday interactions with friends and colleagues. If the Airwave network, and the Airwave service handsets, cannot deliver this full range of functionality, and other systems do, it is somewhat inevitable that those other systems will be used, officially or otherwise. The impact this will have on communications during major emergencies needs to be fully considered and understood.

The pace of technology itself is therefore an important factor in understanding the drivers for and enablers of interoperability. Technology is moving so quickly that it is unrealistic to expect bespoke public systems to keep up at the pace of off-the-shelf market alternatives. In addition, no matter how secure the Airwave network is, the operator using it is likely to have in their pocket an insecure means of communication that can be used to get the message through to the same people.

This is a relatively recent phenomenon. Before the early 1990s, when mobile phone use first became widespread, police officers carried radios because that was the only way they were able to communicate with one another and with their control rooms. Hand-held police radios replaced the old police boxes, which provided fixed telephone lines back to police stations until they

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<sup>38</sup> Ministry of Defence, 'UK Defence Spectrum Management: A Consultation on An Implementation Plan for Reform', May 2008, <[http://www.mod.uk/NR/rdonlyres/8B9CFFD1-6C36-476A-A6C3-8A3E5635DC55/0/dsm\\_consultation\\_report.pdf](http://www.mod.uk/NR/rdonlyres/8B9CFFD1-6C36-476A-A6C3-8A3E5635DC55/0/dsm_consultation_report.pdf)>.

<sup>39</sup> UK regulations would permit this on the production of a business case. At present, the emergency services use less than 1 per cent of available spectrum, so the quantities involved are not excessively large.

were phased out during the late 1960s and early 1970s. It is only in the last ten years that the average police officer (and indeed the average person) has routinely carried with them a device that gives them the ability to communicate with anyone, from anywhere, at any time.

Some respondents remarked that while technological advances have made it easier to communicate, the range of technology available has made it more difficult to know which of the options is the right one in that situation. This needs to be addressed.

### Recommendation 25

During an emergency, personal communications technology may outperform official systems. However, concerns about the security and resilience of such devices indicates the need to ensure full access to official communications systems.

#### The Future: Systems Integration

The points made above highlight that the emergency responder community needs (and is likely to increasingly need) systems integration, not a single system. Systems integration needs to be the bedrock of future communication strategies to:

- Ensure that evolving systems can overlap, and be interoperable and compatible during the roll-out periods
- Overcome different ways of communicating the same information across different systems used by different agencies
- Account for the fact that not all organisations may be able, or willing, to afford the 'preferred' platform
- Accept that some organisations will continue to use legacy systems due to a combination of inertia and unwillingness to change.

The NPIA Guidelines on Multi-Agency Interoperability set out operational guidelines for the use of the Airwave service but many respondents remarked that there has not been sufficient consideration of how (or if) the Airwave network will integrate with the National Resilience Extranet, and in what situations one should be used in priority to the other. Similarly, it is not clear when a message should be sent over the Airwave network and when it is acceptable to send it by other means, such as the Excelerate system used by the Ambulance Service, especially when operators have access to both systems.

The management of the National Resilience Extranet and the Airwave network, and of emergency services communications in general, should reside with a single responsible owner to ensure that they are considered together, share a common operating procedure and do not become siloed.

### Recommendation 26

The future of shared communications between emergency responders must be built from a foundation of systems integration, into which all currently used systems can be integrated, as well as those used by responder agencies whose involvement may not have been foreseen.

Interoperability relies on the right people being able to communicate with the right people. Too many people communicating with one another at the same time can cause as many problems as a lack of communication. Equally, too many means of communicating (by radio, e-mail, telephone or text) can lead to confusion as to which is the best method to use in a particular situation, unless this is explicitly stated in operational procedures. Processes and systems are needed to ensure that communications are managed efficiently. Vertical as well as horizontal communications need to be subject to standard operating procedures that are understood by all users.

### Summary and Conclusions

In summary, the future of communications interoperability needs:

- To develop a greater understanding of the social aspects of communication
- To focus on systems integration rather than a single system
- To accept that some responder agencies communicate mostly by voice, others mostly by data, to respect these differences and to understand how this impacts on operations.

Further research needs to be carried out into these issues before significant decisions are made on any future communication strategies or operational guidelines.

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Interoperability cannot be done in isolation

Category 1 blue-light responder

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Interoperability is not about technology, is it about people and processes. It is about the communication of social interactions, not the communications technology of ICT. Funding new technology is often the easy option to show that something is being done to improve interoperability, but shared radio networks and secure extranets are of secondary importance to the operational procedures of who needs to communicate, who they need to communicate with, what they need to communicate and through what chain of command.

In the past, the emphasis has been placed too heavily on technological solutions without fully understanding the human factors that will ensure the technology is used appropriately once it is rolled out. Operational guidelines for the Airwave network should have been developed at the very beginning of the Public Safety Radio Communications Project, alongside the network itself; the fact that they were not published until more than five years after the network went fully operational is a typical example of how the emphasis is skewed towards technology rather than human factors.

### Recommendation 27

More research needs to be carried out into the way emergency responders communicate during multi-agency working so that their technological needs can be properly assessed. New systems must address operational needs of the entire community – not just one responder agency – and make provision for integrating systems already in use, across the entire response community and by agencies whose involvement had not been expected prior to the event.

Focusing academic study and research on this area in future will help to understand the landscape. However, without a single responsible owner for the emergency services, there is little chance of any research findings being acted on or making any real difference. The problems continue to point back to the fragmentation of the sector – the lack of a single

top, the lack of a single responsible owner, and the lack of a single framework through which to move things forward. Creating this single framework should be a priority for the new government to ensure emergency response capabilities meet the challenges of the twenty-first century.

### **Recommendation 28**

Creating a single framework for the emergency services and a single responsible owner for emergency response in the UK should be a priority for the new government.

### Recommendations

Based on the quantitative and qualitative research phases, which in total surveyed more than one hundred respondents from across the entire emergency response community, RUSI would make the following twenty-eight recommendations that should be considered by new government when forming future policy on civil protection and emergency management.

#### Recommendation 1

Further research needs to be carried out into the social science that enables or inhibits interoperability. At present, funding for this kind of research is much more scarce than funding to research and develop new technology. This needs to change if the drivers and enablers of interoperability are to be fully understood in future. No matter how well technology works, it will not ensure interoperability if essential players do not want to use it, cannot use it, do not know how to use it or do not know what they are using it for.

#### Recommendation 2

Further research is needed into the relationship between multi-agency working during routine operations, planned large events, and major emergencies in order to understand to what extent they are similar and to what extent they differ.

#### Recommendation 3

The emergency services would benefit from a single responsible owner at national level, in order to bring the disparate organisations together, to make joint-working easier during planning, exercising, response and recovery and to ensure there is oversight of the work of individual organisations in the context of emergency management as a whole.

In the absence of a single agency responsible for all Category 1 and 2 responders, ownership of multi-agency interoperability projects should not sit within one government department (and therefore with one Category 1 Responder agency) but be genuinely cross-departmental. The Civil Contingencies Secretariat within the Cabinet Office is the best available current home.

#### Recommendation 4

If interoperability projects have to sit within a government department responsible for only one or some of the end-user agencies, senior management positions should be rotated between the end-user responders regardless of the ultimate ownership of the project. It would be more appropriate, however, for them to sit within the Cabinet Office, with representatives from the end-user agencies seconded into the CCS for the duration of the project.

#### Recommendation 5

Local Resilience Forums, and the LRF structure, should be taken as the basic foundation for pushing interoperability forward.

#### Recommendation 6

The government needs to be mindful that support for a single government agency responsible for all the emergency services is not universal, and take the concerns of responders into account.

#### Recommendation 7

The development of a National Resilience Forum to enable responder agencies to work together to assess capabilities and to plan a co-ordinated response without losing their individuality should be a priority for the government. There is widespread support for this model as a driver for interoperability between the C1 and C2 responders.

#### Recommendation 8

A National Operations Centre (or a series of National Operations Centre facilities) could co-ordinate the response to a major incident and manage the logistics of the response. This should be considered as a legacy use for the National Olympic Coordination Centre. Command decisions, however, must remain at the local level.

#### Recommendation 9

A national resilience budget and a national procurement programme should be provided and administered centrally, to drive financial efficiency and technological standardisation. If additional funding cannot be found, the money made available

for such developments may have to be reallocated from existing budgets.

**Recommendation 10**

National training courses, qualifications, and exercise and testing programmes should be introduced to ensure standardisation and easy comparison of skills and capabilities between different agencies. This work should be led by the Emergency Planning College.

**Recommendation 11**

More research is needed into the role of training and exercising as drivers of interoperability, and the relationship between academic study and vocational training in multi-agency interoperability.

**Recommendation 12**

Statutory guidance and mandated compliance is needed to ensure that policy set by central government is acted upon, operational procedures are followed and technology is taken up. Penalties should be imposed for non-compliance.

**Recommendation 13**

A full understanding of the emergency management landscape, including exactly who is involved, in what circumstances and in what way, is vital. Central government should earmark funding for social science research on the human factors required to enable interoperability and make this a priority over funding for technical solutions.

**Recommendation 14**

It should not be assumed that all responder organisations can fit a standard model. Interoperability models must be flexible and respect organisational differences. Where it is genuinely difficult for an organisation to modify its operations to fit the general model, alternative ways of integrating that agency should be explored.

**Recommendation 15**

Multi-agency working should consider the relative seniority of representatives to the group and the impact this will have on their ability to make decisions for their agency during an actual event. In some cases, the usual representative may need to be

the adviser, not the commander, during the actual incident. This relationship needs to be understood and planned in advance of an event.

**Recommendation 16**

More work needs to be done to understand the use of security classification during multi-agency working, including whether high security levels are strictly necessary, or whether there are situations in which some security classifications might be relaxed or made more flexible.

**Recommendation 17**

Multi-agency working must consider the budgets available to all responders and be wary of making participation dependent on expensive technology or equipment that not all agencies can afford.

**Recommendation 18**

In future, systems integration is likely to be more important to communications during multi-agency operations than the use of a single communications system. Communications integration needs to acknowledge that agencies will use legacy systems alongside new developments; surge capacity may be provided by organisations not operating on official systems; and responders will use personal communications equipment alongside secure networks. The implications for operations need to be fully understood.

**Recommendation 19**

Where commanders from different organisations are located at the time of the incident, and how they arrive at the incident scene (if, indeed, they need to be there), needs to be better understood so that differences can be worked through and solutions identified. It may not be possible for some organisations to modify their operational procedures to fit a standard model.

**Recommendation 20**

Information on changes and updates to existing procedures or practices needs to be pushed to those who need it, and mechanisms introduced to ensure that information is absorbed and acted on. Mandating compliance with certain interoperability guidance may help this and should be considered.

### **Recommendation 21**

The popularity and effectiveness of joint training and exercising opportunities as a driver for understanding other organisations' needs and capabilities should be at the centre of future efforts to improve interoperability. New guidance, operational procedures and policy should be tested and exercised as both part of the process of development and of the implementation strategy.

### **Recommendation 22**

More research and evaluation needs to be carried out on the structure, use and role of Gold Standard and the Emergency Planning College in improving multi-agency interoperability and the understanding of capabilities across all C1 and C2 responders. In particular, the capabilities assessment role of Gold Standard and its use as a training programme need to be clearly delineated.

### **Recommendation 23**

Joint training between responder agencies and shared modules as part of initial training for all responder agencies will help to embed a thorough understanding of multi-agency working at an early stage of responders' careers.

### **Recommendation 24**

There needs to be a stronger framework for sharing information and identified lessons from actual events and exercises, so that responders can learn from previous experience.

### **Recommendation 25**

During an emergency, personal communications technology may outperform official systems. However, concerns about the security and resilience of such devices indicates the need to ensure full access to official communications systems.

### **Recommendation 26**

The future of shared communications between emergency responders must be built from a foundation of systems integration.

### **Recommendation 27**

More research needs to be carried out into the way emergency responders communicate during multi-agency working so that their technological needs can be properly assessed. New systems must address operational needs of the entire community – not just one responder agency – and make provision for integrating systems already in use, across the entire response community and by agencies whose involvement had not been expected prior to the event.

### **Recommendation 28**

Creating a single framework for the emergency services and a single responsible owner for emergency response in the UK should be a priority for the newly installed government.

## Acronyms and Abbreviations

<b>ACPO</b>	Association of Chief Police Officers
<b>BAPCO</b>	Integrated ICT for Civil Contingency Responders, formerly the British Association of Public Safety Communications Officials
<b>C1</b>	Category 1 Responder (as defined in the Civil Contingencies Act 2004)
<b>C2</b>	Category 2 Responder (as defined in the Civil Contingencies Act 2004)
<b>CBRN</b>	Chemical, Biological, Radiological, and Nuclear
<b>CCA</b>	Civil Contingencies Act 2004
<b>CCS</b>	Civil Contingencies Secretariat
<b>CFOA</b>	Chief Fire Officers Association
<b>CFRA</b>	Chief Fire and Rescue Adviser
<b>CNI</b>	Critical National Infrastructure
<b>COBR</b>	Cabinet Office Briefing Room
<b>DCLG</b>	Department of Communities and Local Government
<b>Defra</b>	Department for Environment, Food and Rural Affairs
<b>DHS</b>	Department of Homeland Security (USA)
<b>EPO</b>	Emergency Planning Officer
<b>FEMA</b>	Federal Emergency Management Agency (USA)
<b>FRS</b>	Fire and Rescue Service
<b>LESLP</b>	London Emergency Services Liaison Panel
<b>LRF</b>	Local Resilience Forum
<b>NCAF</b>	National Coordination Advisory Framework (Fire and Rescue Service)
<b>NGO</b>	Non-Governmental Organisation
<b>NPIA</b>	National Policing Improvement Agency
<b>NRAT</b>	National Resilience Assurance Team (Fire and Rescue Service)
<b>Ofcom</b>	Office of Communications
<b>PJHQ</b>	Permanent Joint Headquarters
<b>RUSI</b>	Royal United Services Institute

## Annex 1: List of Interviewees

10 August 2009	David Cloake	Head of Emergency Planning, Kent County Council
19 August 2009	Dr Nigel Brown	Lead for Resilient Telecommunications Strategy, Cabinet Office
26 August 2009	Robert Morgan	Airwave SO2, 2 Signal Brigade
26 August 2009	Darren Hallett	Chief Technical Officer, SunGard Public Sector
27 August 2009	Ian Cameron	News Editor, BBC Nations and Regions
27 August 2009	Ray Trotter	Executive Director, BAPCO
1 September 2009	Jason Bricknell	6pm Management Consultancy (UK) Ltd (formerly SunGard)
5 September 2009	Paul Hayden	Chief Fire Officer, Hereford & Worcester Fire and Rescue Service
9 September 2009	Jeffrey Cook	Morgan Aquila LLP
15 September 2009	CC Peter Neyroud	Chief Executive NPIA; SRO Olympic Airwave
15 September 2009	DCS Michael Hallowes	Head of Strategic Operations, NPIA
23 September 2009	Alice Reeves	Assistant Director, Communications Security and Resilience, Department for Business, Innovation and Skills
28 September 2009	Wg Cmdr Richard Garston	SO1 J5 HQ SJC
28 September 2009	Col Nick Chapman	HQ SJC
2 October 2009	Rob Walley	Co-Chair, Multi-Agency Airwave User Group; Brent Council
2 October 2009	Siobhan Scott	Airwave Solutions Ltd
2 October 2009	Rupert Cazalet	Airwave Solutions Ltd
2 October 2009	Tony Baptiste	Fujitsu
15 October 2009	Charles Le Gallais	Gold Standard
23 October 2009	Russ Mannford	Strategic Ambulance Advisor, DH Emergency Preparedness Division
2 November 2009	Siobhan Scott	Airwave Solutions Ltd
11 November 2009	Rupert Cazalet	Airwave Solutions Ltd
23 November 2009	Peter House	Fire and Rescue National Resilience Assurance Team
23 November 2009	Kim Robinson	Chief Executive, Fire Service College
26 November 2009	Geoff Lowe	National Interoperability Manager, NPIA
<b>Follow-up Interviews</b>		
9 November 2009	Kathy Settle	Deputy Director, Local Response Capability, CCS
16 November 2009	Jeanette Innes	Programme Manager for Telecommunications Resilience, Cabinet Office
8 December 2009	Shuna Mayes	Head of Resilience Planning and Strategy, Scottish Resilience
11 December 2009	DCS Michael Hallowes	Head of Strategic Operations, NPIA
<b>Workshops/Events Attended During the Course of the Research</b>		
8 September 2009	Airwave Sharer Seminar	Hill Morton, Rugby
18 September 2009	Airwave Sharer Seminar	London
21 September 2009	FloodEx 2009	Fire Service College, Morton-in-Marsh
24 September 2009	NPIA, DEIT Workshop	London
7 October 2009	BAPCO Roadshow*	Newcastle
4 November 2010	BAPCO Roadshow*	Coventry
13 November 2010	Olympic Security Conference	RUSI, London
24-26 November 2010	Emergency Services Show	Coventry
30 November 2010	BAPCO Round Table	RUSI, London
7 December 2010	Communicating in a Crisis Conference	RUSI, London
22 January 2010	NCAF Information Event*	London

27 February 2010	Alpha Resilience, FRS	Fire Service College, Morton-in-Marsh
1-2 March 2010	Airwave Forum	Birmingham
4 March 2010	Eriksson Cellular Communications	London
15 March 2010	NCAF Information Event*	Wakefield
18 March 2010	MoD JRLOs Conference*	Liverpool
30-31 March 2010	Command and Control Conference*	RUSI, London
9 April 2010	NCAF Information Event*	Bath
21 April 2010	BAPCO Conference	London

\*Indicates attended as speaker, presenting research findings from the project

# INTEROPERABILITY IN A CRISIS 2

## Human Factors and Organisational Processes

Jennifer Cole

Responding to the threats and hazards on the UK's National Risk Register requires a co-ordinated and well-managed response from a wide range of responder agencies. This emergency response community is extremely complex, but understanding how its component parts need to work together during major incidents is vital to ensuring the efficiency and effectiveness of that response.

Efforts to improve interoperability have tended to focus on the compatibility of the technology and equipment used by such responders, and primarily on the development of secure, resilient and interoperable Information and Communication Technology (ICT) systems. However, technological solutions will not significantly improve interoperability if the human factors that drive the use of that technology are not well understood. Communication is more than just the 'C' of ICT.

This report sets out why a better understanding is needed of the relationship between the different responder agencies, how these differences affect the way they are able to work together, and how the barriers to interoperability that have been allowed to develop in the past can be avoided and removed. It sets out the case for creating a single responsible owner for emergency response within central government to ensure that the needs of the emergency response community can be considered holistically, and considers the factors that will determine the success or failure of such an initiative.

## Occasional Papers

Offering maximum flexibility of breadth and depth of analysis, RUSI's occasional papers draw mainly from conference papers, roundtable discussions or commissioned research.