



EMERGENCY MANAGEMENT IN THE SCOTTISH BORDERS

MOBILE GIS SOLUTIONS HELP MANAGE LARGE-SCALE EMERGENCIES STRATEGICALLY AND
ON THE GROUND

Responding to a major emergency poses challenges not only for the organisation tasked with dealing with it but also the individuals who have to manage impact and restoration. Each year, millions of pounds are spent by companies on planning and preparing their response to emergencies but they often overlook, or don't adequately address, the mundane and simple things – the things that make the difference.

This article demonstrates how mobile GIS solutions can help manage large scale emergencies both in strategic terms and on the ground. My own experience of emergency management is from within the utilities but the themes covered would be relevant to any organisation that has a large geographic area to manage.

In the winter of 2001, a snowstorm literally flattened a large part of the electricity network in the Scottish Borders and tens of thousands of customers were without power. The network had suffered major damage right across the area and this damage had to be assessed and repaired before power could be restored.

Dealing with a severe weather event such as this was not uncommon and had been planned for. The emergency plan was implemented, resources mobilised and a management team was sent to the area to take charge and manage the supply restoration. Every effort was made to respond safely, swiftly and effectively.

Because of the scale of the emergency, a temporary command



the emergency response. Had we had at our disposal the mobile GIS tools which are available today, I am confident that the response would have been faster and more efficient.

Fast forward eight years and companies are much more dependent now on IT and communications to support and manage their business processes, to the extent that without these technologies they would be severely disadvantaged. Faced with the increasing expectations of customers and the media, and driven on by tightening regulation and additional legal requirements, many companies have looked to invest further in technology to support their plans. In doing so, they should consider the lessons of the past and make sure that technology will fully support the improvements needed at the operational level as well as corporate.

Of course, many companies feel comfortable operating in emergency mode and are already well versed in managing incidents or emergencies on a daily basis at the operational level of their organisation. Dealing with small scale and unplanned events has become a matter of routine. Many organisations use standard workflow that is available 24/7, supported by IT and mobile communications to manage these events. So it is tempting to think that dealing with a major emergency is just a matter of scaling. However, much of the investment that has already been made over the years has been driven by the need for cost saving and efficiency improvement and will fall well short of what is required in a major emergency. In fact it could be argued that this short-sighted strategy will result in a major failing should it be applied when called on to manage a large scale or exceptional event.

Others approach emergency planning with the view that it may never happen. Rather than investing in advance, they hope that they can buy their way out the problems if and when this unlikely event happens. However, diverse factors including climate change mean that "disaster scenarios" seem to be much more common now or are at least perceived to be so because of the proliferation of media channels. Most companies are either planning to respond to the increased likelihood of an exceptional event or are being forced into it by regulation or statutory obligation, following, for example, the Pitt Review or the revised ESQCR regulations.

When an exceptional event does occur, the main priority is to restore normal service and put things right as quickly and safely as possible. For companies to strategically address all the needs of managing an exceptional event, corporately as well as operationally, they must consider and recognise four major factors:

centre was set up locally. To supplement existing field staff, over 150 line crews were despatched from all over the UK to the new local centre. However, there was no power, the telephone land lines were damaged and mobile phones were not working because the phone masts were either damaged or affected by the power outage. Only major roads were passable, all the others were blocked with snow and it was a 30 mile round trip to the nearest office. Finally, there was a Foot and Mouth crisis in the area so access to farm land was restricted.

As in all major events, it was the simple things that determined how the response was managed. No one knew the geography or the network layout - everyone was from outside the area and most of the field crews had been drafted in from other companies. This meant that not only was access to a map essential but so was access to the network's asset data. Working in sub-zero temperatures with a short number of

daylight hours was difficult enough without the added complication of not knowing the layout of the power lines.

The parts of the network that had been damaged had to be located and then assessed so that resources and materials could be organised before repairs were carried out. All this collected data had to be included in a plan of action; with the added pressure of keeping customers and the media informed of progress and, most importantly, when the power was likely to be reconnected. It took five days and a seven figure bill before the last of the customers had their power restored.

Everything that could have been done to restore power was done as quickly and as efficiently as was possible at that time. However, the missing communications; the lack of local knowledge; the sole dependency on paper maps and the lack of data flow from the field to the centre and back again were all major factors in the effectiveness of

- 1) It can be expected that a company's normal operations will not be able to cope with managing the exceptional event.
- 2) There will be a fundamental requirement for access to a wide range of different organisations' data. These organisations might include road and railway networks, utilities, medical and emergency services. This data is more than likely to be held in multiple storage areas and corporate systems. How this data is gathered, presented and communicated to the operational field staff is critical to the quality of the response.
- 3) Shipping in additional resources from other parts of the business, or even other companies, cannot replace the local knowledge of geography or business operations. These resources need additional support if they are to be brought up to speed quickly and be safe and effective.
- 4) Management assessment and decisions can only be made following the capture of field data. The capture must be easy to achieve and be consistent so that it can be easily accessed and understood by others and can aid decision making and planning.

To take advantage of technology while avoiding potential pitfalls, many companies are considering adopting an instant mapping approach to delivering their emergency plans. Operating independently of back office GIS systems, these solutions can be used whether or not external power or communications are available. Using a mobile GIS toolkit, such as the GeoField suite produced by Sigma Seven, a full mapping set and supporting data from several different organisations can be pre-loaded on to a mobile device ready to be used by the emergency management team. Fully compatible with all major mobile devices, GeoField and all the data sets required can also be easily loaded on to the mobile devices of external emergency response teams.

The maps and data can be accessed via an intuitive user interface by all field staff, regardless of computing ability or knowledge of the geographic area. This means that emergency response teams drafted in to handle the incident have all the mapping information and workflow tools they need to get on with the job. Equipped with these data sets and tools, they can rapidly react to changing situations and revised task lists; a huge benefit in emergencies where unpredictable conditions on the ground can change priorities.

Finally, using a mobile GIS toolkit also allows for simple data capture forms to be prepared quickly and easily, allowing field data to be collected in a way that is consistent and can be transferred back to an



emergency centre ready for viewing and collation.

The number of companies responding to the challenge of improved emergency management is growing, some willingly and others more grudgingly. Corporate dependency on the technology that supports their normal emergency operations understandably influences strategic thinking as they prepare themselves for the exceptional event.

However, given the scale of the task they are undertaking, it is all too easy to ignore some fundamentals and to gloss over other elements that at first glance seem trivial and unimportant. Elements such as providing a

responder in the field with an up-to-date map with supporting corporate data, or in having the ability to collect field data and to return it to a command centre at a time when normal communication methods or the support infrastructure is not available. Integrated mobile GIS toolkits that can be deployed in such an environment have an important role to play in achieving a successful outcome.

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