

Working on a Common Operational Picture



Rod Stafford discusses how emergency organisations can use incident management technology to improve the effectiveness of their response



Earthquake, Italy, 2009: In a complex urban environment building an understanding of the operational situation simply through situation reporting becomes challenging – maintaining it by this means is nigh on impossible

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MODERN RESPONSE AGENCIES ARE faced with an increasingly difficult choice: maintain tried and trusted systems for situational reporting over radio, through exchange of liaison officers, or through centralised briefings – and risk not knowing enough quickly enough; or adopt incident management technology, which risks facing their decision-makers with information overload. But what if there was a different approach – a way to allow commanders and managers at all levels to contribute to and interrogate a Common Operational Picture (COP), which allows everyone to focus on the job in hand, supported by live information, presented in their own perspective?

The COP is a doctrinal concept and, like all doctrine, discussion around it is too often couched in purely military terms. Wikipedia defines COP as: “A single identical display of relevant (operational) information (eg position of own troops and enemy troops, position and status of important infrastructure such as bridges, roads, etc) shared by more than one command. A COP facilitates collaborative planning and assists all echelons to achieve *situational awareness*.”

It is not necessary to delve much further into the entry to realise that this is all about enemies and battles, concepts with no place in a civil context. However, this militaristic definition, with all its associated jargon, does give some hint as to the underlying relevance the concept has to the areas of civil protection and emergency response.

When you think about it, reporting is not actually the most effective way to achieve a shared understanding of the operational situation. Obviously, in a multi-agency context, where terminology may differ, reporting as a tool to build a COP is certainly less effective, but internally, where terminology is not an issue, reporting may not be the best way to understand what is going on.

SITUATION REPORTING

When responding to an emergency, much of the communication between tiers of command consists of descriptions of the situation. Such situation reports are both subjective and time-consuming, and yet it is accepted by all that what these reports are attempting to achieve – a shared understanding of the operational situation – is vital for the effective and efficient conduct of the response.

When the emergency requires the capabilities of more than one type of responder agency then, once again, the majority of the communication between agencies also consists of descriptions of the situation. These reports are even more subjective than those delivered internally, as they presume that those compiling the reports understand the information needs of those for who they are intended. Where they don't, then vital information can be omitted, and where they do understand that information irrelevant to them might have relevance to others, the report can be overloaded with detail.

In the example of an incident where there are three responding agencies, each with three tiers of command, the middle tier has to

communicate to four other command nodes (up, down and to two other agencies) in order to maintain a shared understanding of the situation – a level of reporting/communicating, which rapidly escalates when a greater number of agencies are involved. Imagine the situation in a complex urban environment, where there might be tens of agencies involved in the response; building an understanding of the operational situation simply through situation reporting becomes challenging – maintaining it by this means is nigh on impossible.

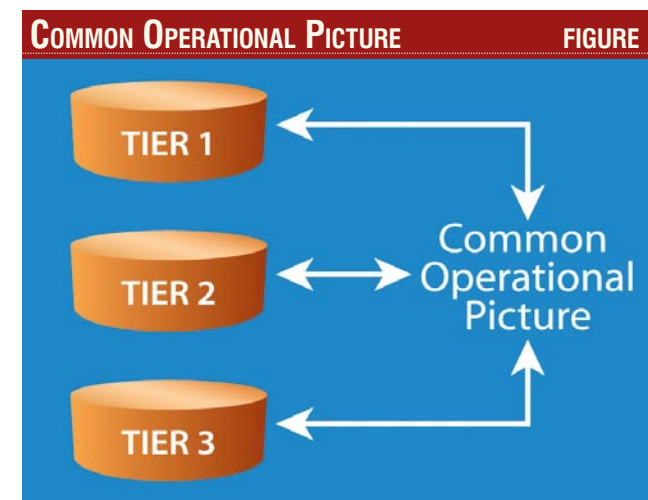
Even when the physical distance between command nodes is limited, the problem remains; there are countless examples of disaster response where each agency establishes command posts near the scene, in close proximity to each other, and yet they fail to share an understanding of the operational situation. Or where purpose-built multi-agency command centres house not only a meeting place for a strategic co-ordinating group, but also cells for individual agencies to base liaison staff and maintain links back to their own command facilities – yet a casual observer walking around the cells would see each with their own whiteboards, their own maps, their own situation boards, and all the time the staff are fighting a losing battle to keep their walls current with the information being passed around from their fellow responders.

These examples articulate the core problem: that we don't want to know what someone thinks is going on, we want to know what is actually going on – and then we will interpret its meaning in the context of our own organisation and role.

This is where procedure and technology come in, ie technology which enables the building and sharing of a COP, and procedures that ensure that the right people contributed the right information at the right time, and in turn were able to access the right information in the right context.

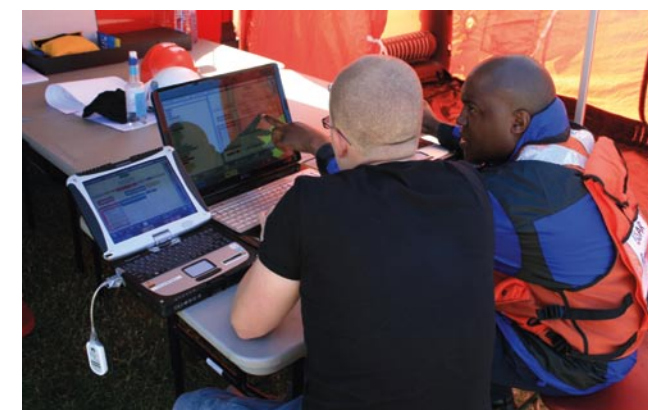
This approach is illustrated in the context of a single responder in Figure 1, where all tiers of command contribute to and interrogate a system which holds the COP. Clearly this does not negate the need for communication between tiers of command, but it does mean that this residual communication will be focused on the business of command, and not on asking and answering questions about what is going on.

The next obvious question centres around what exactly a COP should consist of. The military will tend to focus on spatial information – ie anything that can be depicted on a map – however, in the civil protection context there is much information which adds substantially to the understanding of a situation:



Illustrating how all tiers of command can contribute to and interrogate a system which holds the Common Operational Picture

Information about your own resources (not just where they are, but what they are doing, for who, and when they're likely to be free for the next task); about the physical environment (building plans, contents of storage facilities etc); and about known risks (type of hazard, response plans). Add to that live imagery from existing sources (CCTV, command vehicle cameras, Heli-tele etc) and we have



VectorCommand's Command Support System improves emergency management response effectiveness by providing commanders in the field and at headquarters, at all levels and in all agencies, with a shared Common Operational Picture, in real time



Bushfires Victoria, Australia, 2009: Creating and sharing a real-time Common Operational Picture is safety-critical for the optimal use of resources during the management of fast moving, large scale events

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a complex framework for understanding what we mean by 'what's going on'. The overall effect of this technology in the context of emergency management, would be the ability to co-ordinate multiple teams from multiple agencies into a single capability. Technology used in this way is in fact transformational; the junior commander using a small touch-device to sketch out the next stage of their plan to their team (captured into the system); an incident commander allocating resources into the response structure which have been made available by control (integrated with mobilising data), checking what the effect of the situation might be on nearby risks (pre-loaded onto the system), and logging his/her decision and reasoning (immediately visible to his/her subordinates and seniors) and then overseeing the conduct of the plan on a dynamically linked map, while watching teams on Heli-tele (managed through the system) and simultaneously briefing his/her commander (conferencing through the system). Put simply, every commander at every level, and their direct support staff, should be able to contribute to the COP, while simultaneously being able to interrogate the system for information available only because of the cumulative contributions of others.

SHARING DATA

Yet we need to avoid a technically trivial 'website' solution to this problem; if all data is stored in one bucket, losing your communication would leave you with nothing – and is there ever a post-incident report which does not cite poor communication as an issue? What we need is a system which allows all users to have the incident data local to them, with changes that are made being trickled across the network of users in the background, as and when they occur. In this way you would still be able to interrogate everything that you had access to, up to the moment you lose contact – and as soon as the system finds a communication path again you will get an instant refresh of anything you've missed in the meantime.

So, a new approach. An approach that prevents our commanders having to spend all of their time reading and compiling reports, and yet does not overload them with irrelevant information, letting them get on with the job in hand and basing their decisions and actions on a Common Operational Picture – live.

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