

## *: Can DSS/IS/IT improve the Incident Command System? What needs can DSS meet?*

YES. Readers may recall my initial discussion of computerized decision support in crisis/emergency situations (DSS News, 08/31/2003). That Ask Dan! concluded with a brief summary of the McKinsey & Company reports on the New York Police and Fire Department responses to the 9/11/2001 terrorist attacks. "The NYPD report mentioned improving communications and information flows. The report on the New York Fire Department response stressed the need for more inter-agency cooperation, improved communication and technology capabilities, and the use of the Incident Command System (ICS)." At that time I was "only vaguely familiar with ICS and its procedures". This column is a follow-up and an expansion of prior discussions on computerized decision support for crisis and emergency planning, response and management.

### What is the Incident Command System (ICS)?

In 2003, I knew that ICS was a broad approach for managing crisis/emergency situations. In February 2005, as part of my preparation to give a keynote talk at ISCRAM 2005 ([www.iscram.org](http://www.iscram.org)), I decided to expand my knowledge of crisis and emergency management, response and planning. I'm a DSS generalist, but I wanted to focus my talk on that more specific context. After some Google searching I found the website for the Emergency Management Institute ([www.training.fema.gov/emiweb/](http://www.training.fema.gov/emiweb/)). The Institute is operated by the U.S. National Emergency Training Center (NETC) in Emmitsburg, Maryland. In the U.S. Government bureaucratic hierarchy, EMI and NETC are part of the U.S. Fire Administration, Federal Emergency Management Agency (FEMA), U.S. Department of Homeland Security.

I read some of the EMI training materials, followed links and then I registered to take the online course offered by EMI on the Incident Command System. I was skeptical about taking a "course", but I decided I would try the interactive web-based IS-195 course. At a minimum, I could assess the training technology and perhaps expand my knowledge of ICS and Emergency Management. Basic Incident Command System (IS-195) is an Independent Study course offered with printed materials dated January 1998 and an interactive web-based course. Testing is web-based and a student needs to receive a score of at least 75% correct to pass the course and receive a Certificate of achievement from FEMA. My score on the pre-test was higher than 75%, but I was on a mission of discovery and I completed all of the interactive lessons, read some materials I printed out and studied for the online exam. I passed the exam on March 6 and recently received my certificate. The web-based course materials were sophisticated and well-constructed. I found the documents on ICS at EMI, NOAA, NRT and at other websites helpful. For those new to this field, I strongly recommend starting with the EMI web-based courses.

Page 1/5

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The Incident Command System (ICS) is a system for managing emergencies. ICS is a "standardized on-scene incident management concept designed specifically to allow responders to adopt an integrated organizational structure equal to the complexity and demands of any single incident or multiple incidents without being hindered by jurisdictional boundaries". According to EMI, "several States have adopted ICS as their standard for emergency management, and others are considering adopting ICS. As ICS gains wider use, there is a need to provide training for those who are not first responders (i.e., law enforcement, fire, or emergency medical services personnel) who may be called upon to function in an ICS environment. This Basic Incident Command System (ICS) Course will begin to meet that need."

In the early 1970s, ICS was developed to manage rapidly moving wildfires. According to a number of sources, the system was intended to address the following eight problems: 1) too many people reporting to one supervisor; 2) different emergency response organizational structures; 3) lack of reliable incident information; 4) inadequate and incompatible communications; 5) lack of structure for coordinated planning among agencies; 6) unclear lines of authority; 7) terminology differences among agencies; and 8) unclear or unspecified incident objectives. The key player in ICS is the Incident Commander on the scene, but a Command Center provides a reporting system to a unified command structure. ICS is a framework or template for creating and expanding a temporary organization for responding to an emergency or a crisis. ICS is oriented toward consolidating the efforts of public sector agencies, but conceivably it can mesh the efforts of public agencies, not-for-profits, private sector organizations and individual volunteers.

What are the DSS/IS/IT issues?

The Incident Command System is bureaucratic, detailed and specific. To support response and management of an "incident", some transaction processing is necessary and much of this is done today on paper forms, as an emergency grows in scale accounting issues emerge that require an accounting information system, and as more responders participate and the scale of an incident increases there is an increasing need for decision support. Maps are common decision support representations in emergencies, but Incident Commanders and their staffs make use of other tools, data and models.

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Information technology must scale up and down as appropriate to an incident, DSS/IS/IT can serve particular responders on the scene of an incident, for example supporting triage by a medical professional, and DSS/IS/IT can be used in a permanent Command or Operations Center for multiple tasks.

And some more specific issues:

Is commercial off-the-shelf software (COTS) or specialized, customized software more appropriate for ICS? Or do both have a place in supporting the ICS? In general, I favor using software like Microsoft Access and Excel to create templates that can be used in a specific incident situation. For example, an Access Database can support ICS form 201 (Incident Briefing), ICS form 203-OS (Organization List), ICS form 207-OS (Organization Chart), ICS form 204 (Assignment List), ICS form 219 (T-Cards) and the Resource summary. Excel applications can also be developed to record and analyze this type of management information. As the scale of an incident increases, more specialized, web-based applications may be useful for distributed data gathering, data analysis and decision support in the temporary ICS organization. The web is an excellent means of gathering, maintaining and sharing data from ICS form 209-OS (Incident Status Summary) and for ICS form 214-OS (the Unit Log) and form 214a-OS (Log for individual units). The Unit Log "records details of unit activity, including strike team activity."

Electronic ICS forms have been developed by the Office of Response and Restoration, National Ocean Service, NOAA (<http://response.restoration.noaa.gov/oilaid/ICS/ICS.html>), but MS Access and Excel templates are potentially much more useful than MS Word documents or PDF documents. Specialized software is needed for specific types of incidents. For example, a variety of Oil Spill Software is available from NOAA, including GNOME, ADIOS 2, DOGS, and SpillTools. Making this specialized software available for download from a website helps insure that the most recent version will be used when an incident occurs. Also, web-based communication systems for incident responders like ResponseLink ([spills.incidentnews.gov/login/ORRresponselink.htm](http://spills.incidentnews.gov/login/ORRresponselink.htm)) or the E-Team incident management system (Walton, 2003) can be useful.

What software is needed to support an Incident Commander? What technology training is needed by an Incident Commander? An Incident Commander needs to be comfortable in a high technology

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"cocoon" of wireless interconnectivity, web access and stand-alone tools like MS Access and Excel. An Incident Commander needs to be able to check for and resolve hardware and software problems. If some or all of the technology infrastructure breaks down, an Incident Commander also needs to be able to improvise and continue functioning. That situation may involve using stand-alone computing or no information technology support.

How can data be gathered easily, inexpensively and reliably during an incident? We need to gather data before we can use data-driven or model-driven DSS. Emergency response planners need to consider using radio frequency identification (RFID) tags for resources as they check-in at an incident scene. RFID tags can be used to track, inventory and monitor individual emergency vehicles and emergency responders. Tag them at check-in!! Personnel and equipment arriving at an incident "can check in at various incident locations. Check-in consists of reporting specific information which is recorded on a form. IS/IT can help managers at these locations record the information and share it immediately with the Resources Unit. Then incident management personnel and command centers need to be able to capture the RFID data in real-time. Remember the rule: gather the data at the source in digital format whenever possible.

Can computerized support assist in on-going emergency operations planning? Another key aspect of an ICS is the development of an Incident Action Plan (IAP). If an incident continues for more than about 12-18 hours, a planning cycle is typically established by the Incident Commander and a Planning Section Chief is designated. An Incident Action Plan is then developed for the next operational period (usually 12- or 24-hours in length) and submitted to the Incident Commander for approval. A web-based Planning DSS can assist in development of an IAP for a particular operational period and help focus available resources on the highest priorities/incident objectives. A web-based planning process can potentially speed-up the planning process and better integrate staff inputs and identify critical shortfalls.

Over an extended crisis/emergency, how should technology planning and technology operational issues be incorporated into the command structure? Part of the problem in emergencies is that information technology can malfunction, breakdown and create ancillary problems. The larger the scale of the crisis/emergency in terms of number of people affected and the number of responders, the more likely it is that technology problems will occur. Currently the Incident Command System (ICS) doesn't adequately address how information technology will be supported, maintained and mobilized during an incident. More technology planning is needed for crisis/emergency management and potential Incident Commanders need an increasingly high level of technology sophistication. Emergency simulations and exercises need to use a wide variety of technologies

## *: Can DSS/IS/IT improve the Incident Command System? What needs can DSS meet?*

and technology breakdowns should be simulated. As far as ICS information technology operations ... follow the KISS approach ... Keep It Simple Stupid.

### References

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