THE VIRTUAL EMERGENCY OPERATIONS CENTER:  AN INTERNET APPROACH TO EMERGENCY MANAGEMENT WORK

by

Walter G. Green III, Ph.D., VaPEM
Assistant Professor of Emergency Management
University of Richmond

A Paper Presented At The 2001 Virginia Emergency Management Conference

Williamsburg, Virginia
13 March 2001

Copyright 2001 by Walter G. Green III. All rights reserved.
THE VIRTUAL EMERGENCY OPERATIONS CENTER: AN INTERNET APPROACH TO EMERGENCY MANAGEMENT WORK

by

Walter G. Green III, Ph.D., VaPEM

INTRODUCTION

In July 1999 a small team of volunteers in Virginia started to develop an Internet based facility to deliver information services for emergency management organizations. Named The Virtual Emergency Operations Center, this effort has evolved over the past two years, both in technology used and in the methods of doing work. Today it supports 24 agencies by formal Memorandums of Understanding, including the Virginia Office of Emergency Medical Services, the ESF-8 emergency response system, and the Virginia Voluntary Organizations Active in Disaster. In March 2001 The Virtual Emergency Operations Center completed its 26th activation for a potential or ongoing emergency or a major disaster exercise.

E-EMERGENCY MANAGEMENT – THE STATE OF NATURE

At the 2000 conferences of the State and Local Emergency Management Data Users Group and The International Emergency Management Society, I suggested the term e-emergency management, or as now abbreviated e-EM (State and Local Emergency Management Data Users Group 2001), to describe the use of the Internet in emergency management. E-emergency management today comprises a wide range of approaches to the use of the Internet, some that provide information that does not change, some that provide event specific disaster information, and a few that are interactive.

Three privately operated sites offer a range of views of the potential of the medium. Emergency Management Gold (2001) provides a large library of materials and information ranging from forms to contact data as a reference for emergency managers. The Disaster Center (2001) provides links to a state-by-state collection of information sources and publishes a daily national situation report assembled from the situation reports of a variety of agencies. And the Emergency Email Network (2001) offers to provide electronic mail notification to subscribers of a range of emergency events at the county level across the United States.

An admittedly limited convenience survey of local emergency management agency Internet sites suggests that the primary use of these sites is communication outward from the agency to the citizens (see Table 1). In only one case was the site obviously used (beyond the opportunity for e-mail contact) to gather information through reports from the public – the Escambia County, Florida, Department of Public Safety (2001) has a damage report form that citizens can complete and submit electronically after a disaster event. In no case was there an obvious way for other agencies to use the site to communicate with the emergency management agency.
Table 1. Internet Site Components

<table>
<thead>
<tr>
<th>Type of Function</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>agency contact information</td>
<td>11</td>
<td>91.7%</td>
</tr>
<tr>
<td>general links, many news, weather or organization specific</td>
<td>10</td>
<td>83.3%</td>
</tr>
<tr>
<td>public education information, including hazard maps and shelter data</td>
<td>9</td>
<td>75.0%</td>
</tr>
<tr>
<td>agency mission statement</td>
<td>5</td>
<td>41.7%</td>
</tr>
<tr>
<td>local situation report</td>
<td>5</td>
<td>41.7%</td>
</tr>
<tr>
<td>information on specific programs (amateur radio, Community Emergency Response Team, Skywarn, local emergency planning committee, etc.)</td>
<td>4</td>
<td>33.3%</td>
</tr>
<tr>
<td>information on other public safety departments</td>
<td>3</td>
<td>25.0%</td>
</tr>
<tr>
<td>Project Impact data</td>
<td>2</td>
<td>16.7%</td>
</tr>
<tr>
<td>staff names and job descriptions</td>
<td>2</td>
<td>16.7%</td>
</tr>
<tr>
<td>copy of emergency operations plan</td>
<td>1</td>
<td>8.3%</td>
</tr>
<tr>
<td>description of the jurisdiction</td>
<td>1</td>
<td>8.3%</td>
</tr>
<tr>
<td>description of legal authorities for the agency</td>
<td>1</td>
<td>8.3%</td>
</tr>
<tr>
<td>press releases</td>
<td>1</td>
<td>8.3%</td>
</tr>
<tr>
<td>recent disaster history of the jurisdiction</td>
<td>1</td>
<td>8.3%</td>
</tr>
<tr>
<td>form for citizen input of disaster damage report</td>
<td>1</td>
<td>8.3%</td>
</tr>
</tbody>
</table>

Note: This survey is based on 12 local emergency management agency sites accessed from Web Crawler, a search engine, on March 10, 2001. The sites chosen for examination were the first 12 sites presented by Web Crawler.
When this examination is extended to state emergency management agencies, the level of sophistication of the sites increases, but other changes in site contents reflect expectable changes in mission and products. For example, state sites typically include the current state newsletter, a greater emphasis on media oriented products, employment information, etc. From an operational standpoint a large number of states do provide current situation reports, for events or on a daily basis, and even access to event logs, on the Internet.

However, only two states that I have been able to identify allow for interaction between the state and local emergency management agencies during on-going disaster. The Florida Division of Emergency Management (2001) provides the greatest degree of interaction, with local agencies being able to access and update state databases and view and update the event tracking system. The Virginia Department of Emergency Management’s (2001) On-Line EOC is in its early stages of development, providing access by local agencies to update their situation reports and damage assessment data.

THE VIRTUAL EMERGENCY OPERATIONS CENTER (TVEOC)

The Organization

The Virtual Emergency Operations Center is an all volunteer organization, with members in Virginia, New Jersey, and Colorado. TVEOC is a member of the Virginia Voluntary Organizations Active in Disaster and the Emergency Preparedness Committee of the Virginia-Santa Catarina Partners of the Americas. It is a partner in the Emergency Information Infrastructure Project and the United States Committee of the International Year of Volunteers 2001. TVEOC volunteers are Regular Service Volunteers under the provisions of the Virginia State Government Volunteers Act (Commonwealth of Virginia 2001).

Organizational Rather Than Public Services

The Virtual Emergency Operations Center (2001) offers a different approach to the use of the Internet in emergency management. Unlike other sites that provide public information, the intent of TVEOC is to offer support only to government and voluntary disaster response organizations. This relationship is established by submission of a Memorandum of Understanding (MOU) by potential users using a form on the site, and the assignment of a MOU number to the organization by TVEOC. This MOU commits TVEOC to support an organization at an agreed-upon level of service and provides the basis for electronic mail notification of activation.

TVEOC is not yet password protected, but access is to some extent limited by a conscious decision not to attempt to list the site with search engines and a general policy of discouraging links from organizational pages. In addition, key pages bear headers warning members of the general public not to use information on the pages for decision making and directing them to use official sources in their community.
Incident Command System Structure

Central to the functioning of The Virtual Emergency Operations Center is its use of an Incident Command System (The Virtual Emergency Operations Center 2000b) to perform work in the same manner that work is performed in most emergency operations centers. If we accept that a primary role of an emergency operations center (EOC) is information collection, analysis, and dissemination (Perry 1991), the problem in an online environment is how to do this work in a distributed manner using a staff located in different places. Conceptually I would argue that simply having a group of people seated in a traditional bricks-and-mortar EOC using the Internet as a means of collecting and disseminating information does not make the operation virtual. Similarly one person in one place collecting links and pasting together a document from information on other sites is not a working EOC.

What this requires is that individual information products must be composed by the staff members who are expert in, and have the knowledge required for, the various parts of a product. As a result, something as simple as the production of TVEOC’s daily situation report on its own activities requires input from the Incident Commander (the mission), Operations Section Chief (summary of the day’s activity), Supply Unit Leader (personnel available), Time Unit Leader (work hours completed), and Situation Unit Leader (actions of the supported organizations and the general event description), before a final document is posted. Although in a small event two people might fill all of these roles, there is still a significant information collection, compilation, and editing workload.

Interactivity

To allow the staff to gather and present information in standardized ways, the site is increasingly using forms that allow users in supported organizations to input information directly into the site. For example, an Emergency Spot Report appears on the initial page for use by any MOU holding agency to submit information on their response or on disaster impacts in their area. The Virginia Office of Emergency Medical Services Report format appears as a form that can be used by ESF-8 units to report their status, location, logistics needs, and response activities. The use of forms also allows staff to report their availability and time worked and to generate a rapid format warning order on detection of a potential emergency event requiring a response. In addition to generating an electronic mail message as a basic source document, each form also is automatically archived.

General Products

The significant product available to all users of The Virtual Emergency Operations Center is the Situation Briefing. Updated at least daily, and sometimes as many as nine times a day, during an emergency event, it attempts to provide a fused, wide area view of the event, significantly different from other products. First, as a fused briefing, it incorporates information available from governmental sources, the news
media (including the on-line press), and inputs from holders of Memorandums of Understanding. The staff of TVEOC analyzes the reports, evaluates their currency, and assigns confidence ratings (high, medium, or low) based on the quality of the source and the degree of verification possible for the information. Second, as a wide area briefing, it provides a description of the event independent of jurisdiction boundaries. This may prove useful to jurisdictions on the periphery of evolving events or to organizations with branches in the impact area.

Tailored Products

The Virtual Emergency Operations Center has the capability to tailor information products, even during an ongoing emergency event, to meet the needs of supported organizations. To date, specific pages have been developed to provide information needed by the Virginia Office of Emergency Medical Service’s Coordination Teams, Disaster Task Forces, and Critical Incident Stress Management Strike Teams, the Central Virginia Federal Coordinating Center of the National Disaster Medical System, and the Virginia Voluntary Organizations Active in Disaster. TVEOC has demonstrated the capability to accept data for these pages from electronic mail, facsimile, telephone calls, and even by deployment of a representative to the supported agency site. Experience in the Franklin, Virginia, flooding response subsequent to Hurricane Floyd in 1999 established the value of these services in reducing the volume of telephone calls the staffs of supported agencies had to handle from their own personnel.

Internal Management Products

Operating an emergency operations center in a virtual environment means that the standard paper documents that control operations in a normal EOC are absent. However, the need for this information does not go away and may be even greater, given the lack of physical contact between staff members. Therefore, all of the documents you would normally expect to see in any operation of this type appear on-line (see Table 2).

PERSPECTIVES

The experience of The Virtual Emergency Operations Center suggests that performing significant emergency management work on the Internet is possible. Benefits identified for supported agencies include:

… rapid information dissemination (much faster than the traditional mass facsimile), although absent a requirement to acknowledge receipt there is still the same uncertainty as to delivery.

… the ability to make information available to all members of an organization, reducing internal communications requirements and better informing responders early in an event.
Table 2. Internal Management Products

<table>
<thead>
<tr>
<th>Document</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warning Order</td>
<td>initial alerting of staff of a developing emergency with known details needed for planning</td>
</tr>
<tr>
<td>Mission Order</td>
<td>translates guidance of the organization’s emergency operations plan into specific guidance for a disaster event and adds new details gathered subsequent to issue of the Warning Order</td>
</tr>
<tr>
<td>Incident Action Plan (IAP)</td>
<td>daily plan in Incident Command System standard format providing objectives and staffing for the day</td>
</tr>
<tr>
<td>Situation Report (SITREP)</td>
<td>daily summary of operations in The Virtual Emergency Operations Center (but not of the disaster – that is summarized in the Situation Briefing)</td>
</tr>
</tbody>
</table>


… enhanced survivability – TVEOC functions are performed in three separated states, and with a back-up site in case of failure.

… the ability to rapidly change the product to suit the situation. Modern page building software allows changes in the way information is presented in minutes.

… a clear audit trail of information presented – preserving a paper copy of the display with a date stamp on it is as simple as printing the displayed page.

However, this is not a universal panacea. A virtual approach probably will not assist a single community with survivability issues – when the power goes down all over the jurisdiction others loose the ability to access as their batteries run down, even if you are running your site on generators. This approach is dependent on the survival of telephone circuits, even if you explore data card and cellular technology for Internet connectivity. It requires software knowledge and Internet literacy, human capabilities that are not universal. And finally, it demands staffing by people who like to work in a virtual environment. Because there is a tendency to view on-line work as not being real work, especially among volunteers, the staffing issue is not insignificant.
WORKS CITED


