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ELEMENTS OF COMMUNITY RESILIENCE IN THE WORLD TRADE CENTER ATTACK

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Abstract

In this paper, we examine the elements of resilience exhibited by New York City departments as they responded to the World Trade Center attack in September, 2001 while at the same time losing their primary emergency operations center (EOC) facility at 7 World Trade Center. Our focus lies primarily on the reestablishment of the EOC in the days that followed its destruction. Data were gathered during exploratory fieldwork commencing within two days of the attack and continuing for two months thereafter. We base the results on over 750 collective hours of systematically observing key planning meetings and highly secured facilities, including the EOC, incident command posts, supply and food staging areas, and the disaster site also known as 'ground zero'. The data and findings we present in this paper are preliminary; however, they offer initial insight into understanding organizational and community resilience in disaster situations and therefore warrant our consideration.

The paper begins by presenting conceptions of resilience as understood from several disciplinary perspectives, noting that work in these disciplines has sought to understand how a natural or social system that experiences disturbance either sustains its functional processes or fails to do so. Although researchers differ in the terms they use to describe different features of organizational resilience, they nevertheless orient their analyses around such features as redundancy, resourcefulness, communication, and the capacity for self-organization in the face of extreme demands.

We then present a description of the attack and subsequent evacuation and destruction of the city’s Emergency Operation Center, located on the 23rd floor of 7 World Trade Center. This center, one of the most sophisticated of its type in the world, had been the coordination site for the various organizations that would respond to any major emergency affecting the city. It contained computer-equipped workstations for the organizations’ representatives, a communications suite, a conference room, a press briefing room, and a large number of staff offices. Following the evacuation of the EOC, emergency management personnel moved to intermediate facilities, and finally relocated the EOC to its semi-permanent location at a pier facility along the Hudson River. Within two days of the attack, emergency management personnel had established a site that in many respects mirrored the destroyed facility and which, though lacking in elegance, preserved and enlarged many of the functional attributes of the original EOC complex.

We conclude with the observation that, although the physical facility was destroyed, the organization that had been established to manage crises in New York City

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remained substantially intact, enabling management of a response that drew on the resources not just of New York City, but also of neighboring communities, states, and the federal government. A resilient emergency response was achieved through integrating the adaptive capacity of the response organization with the resources of New York City, private entities, and government at all levels. Availability of resources – which fostered redundancy of capability, pre-existing relationships that eased communication challenges as the emergency developed, and the persistence of organizational schema for response integration and role assignments were among the attributes that contributed to resilience following the attack.

**Introduction**

One key function of an emergency operations center is to centralize at one location the personnel and equipment that are needed to manage a response to diverse types of emergencies. The EOC has multi-hazard capacities; that is, response managers can cope with a variety of disaster types from this location. At the EOC, representatives from organizations crucial to response efforts interpret information gathered from the remote locations of the emergency site and from outside sources – such as maps, satellite data, weather reports, resource inventories, health and safety statistics, and news accounts – to understand and coordinate the disparate, shifting elements of an evolving dynamic situation in order to mount an effective response involving the assets of many branches of government. EOCs are not fully staffed at all times; rather, they are activated only when an event crosses a certain magnitude threshold such that a multi-agency response is needed. Though differing in their design, equipment configurations and capacities, based on their community’s resources and risk exposure, EOCs share the goal of coordinating the interactions of various agencies at different levels of government. They serve as the headquarters for planning and response decision-making during a disaster event and support operational response implementation undertaken in the field. The EOC concept allows for both interpersonal and technically-supported information exchange between the
representatives of different agencies, who are in turn communicating with their personnel either at the scene of an emergency or elsewhere in their respective organizations.

The Emergency Operations Center at 7 World Trade Center was one of the most sophisticated facilities of its type in the world. Occupying much of the 23rd floor, the EOC boasted an array of technological capabilities. There were computer-equipped workstations for up to 68 agencies, arranged into groups called pods (Health & Medical, Utilities, Public Safety, Infrastructure, Human Services, Transportation, Government, and Administration) with an ability to expand by another 40 workstations if the need arose (OEM, 2001). Each workstation was equipped with software that made it possible to perform the specialized tasks of its particular agency. There were computer messaging systems for communicating among staff, a phone system with the provision for microwave back-up, separate systems for Fire, Police, and EMS communications, Coast Guard-operated video monitoring of New York’s waterways, and traffic monitoring of the city’s streets. In addition, a raised “podium” provided selected staff an overview of the EOC and its operations as well as provided access to a variety of sources of weather information, including direct National Weather Service feeds, video conferencing, and ARCVIEW and MAPINFO GIS packages. Podium staff could also view the location of critical systems and facilities, such as the electrical grid, water system, hospitals, and so on (OEM, 2001).

In addition to its explicit, instrumental capabilities, the EOC also fulfilled another more symbolic emergency management capability: the projection of the City’s power. The Mayor’s conference room was dominated by a large table, with a telephone for each person seated at the table. Projection screens along one wall enabled display of maps, charts, and images. Windows enabled policy-level conferees to look out across the work
floor of the EOC, where the representatives of the different agencies staffed the workstations. At the opposite end of the EOC was the press briefing room; the wall behind the lectern was transparent, so that cameras directed at the speaker would also look out at the EOC work floor, where dozens of personnel from various agencies would be working during a typical emergency. The focal point of the work floor was the podium, installed on a raised platform, staffed by officials of the Mayor’s Office of Emergency Management whose job is to coordinate the interaction of the agencies. For example, one feature of this process is calling agency representatives “to the podium” to give or receive information. The OEM official thus is in a commanding position both physically (looking down on the agency representative) and organizationally (able to control the information flow). The visual impression from all directions was typically that of a busy, competent, technologically advanced emergency response in a well-designed, well-equipped facility.

**The Destruction of the Emergency Operations Center**

The broad outlines of the events of September 11, 2001 are now widely known, featured as they have been on television and in other media. For the purpose of this paper, the salient feature of those events is that 7WTC was among the buildings evacuated after the second airplane strike because of the extreme danger. The evacuation of the facility was extremely rapid, and little or no equipment or documentation was saved. Emergency managers, along with the mayor and some agency representatives, kept falling back to intermediate sites to set up a command post but before long each of these sites also proved hazardous or otherwise untenable. They did, however, make use of a mobile emergency operations unit. Eventually they reached the library of the Police Academy but
soon found its configuration and communications capability to be inadequate. Meanwhile, a parallel operations center was established at a nearby high school to serve as a forward staging area. This was a very improvised arrangement, with cafeteria tables being used for meetings, wires running everywhere, and outdated telephones. Nevertheless, this site was set up to parallel the spatial organization of the EOC, with workstations and a command platform. During the night of September 13th, approximately 60 hours after the attack, the operations at the Police Academy moved to a large docking facility along the Hudson River. This semi-permanent facility still housed the EOC over two months after the attack.

**Conceptions of Resilience**

Various conceptualizations of resilience, which can be found in several different literatures, suggest an ability to sustain a shock without breaking; that is, most conceptions of resilience involve some idea of “bouncing back” from a disruption.

Wildavsky (1991: 77) contrasts resilience with anticipation in this fashion:

> Anticipation is a mode of control by a central mind; efforts are made to predict and prevent potential dangers before damage is done... Resilience is the capacity to cope with unanticipated dangers after they have become manifest, learning to bounce back.

Elsewhere, he argues that dealing with unknown hazards “as they declare themselves” is another expression for resilience (Wildavsky, 1991: 70).

Yet another definition of resilience is seen in the business continuity literature. For example, Globalcontinuity.com defines resilience as follows:

> The ability of a system or process to absorb the impact of component failure and continue to provide an acceptable level of service.
While defining resilience is clearly challenging, identifying the features of organizations and other social units that make them resilient is even more difficult. Resilience appears to be as much a set of attitudes about desirable actions by organizational representatives as it is about developing new capabilities. Identifying resilience where it exists is less onerous than creating it where it does not. Nevertheless, the various literatures do appear to converge on a conceptualization of resilience as the ability to respond to singular or unique events; to make “the extraordinary ordinary.”

Weick’s (1993) analysis of events surrounding the deaths of firefighters at Mann Gulch crystallized the concept of resilience as it is currently being developed. In subjecting the account of the disaster that appears in Norman MacLean’s book *Young Men and Fire* (1992) to an organizational reanalysis, Weick identified four principles, tenets, or features that would seem to be necessary to allow for effective responses in rapidly changing, ambiguous conditions. When in place, these principles facilitate the collective “sensemaking” that is required for a group to comprehend and respond to crisis or change. These principles include *bricolage*, which is the capacity to improvise, to apply creativity. Weick cites Bruner (1983: 183), who argues that creativity (which Weick sees as a component of resilience) is “figuring out how to use what you already know in order to go beyond what you currently think.” Second, *virtual role systems* preserve intact in each person’s mind a conception of the system of which they are a part. Each person “mentally takes all roles,” so that even in situations of peril and disruption everyone is able to maintain a shared vision of risks, goals, and possible actions. This allows people to both fill in for an absent member (one who is either physically or cognitively absent) and to refer to that conception to continually align their actions with the shared goals of the
group. Third, *Wisdom* is the capacity to question what is known, to appreciate the limits of knowledge, and to seek new information. Fourth, *Respectful interaction*, drawn from Campbell (1990), consists of respecting the reports of others and being willing to act on them; reporting honestly to others; and respecting one's own perceptions and trying to integrate them with others.

Weick et al (1999) expand on these themes in their comprehensive review of the literature on High Reliability Organizations, adding to resilience a number of other qualities which engender the “mindfulness” needed to “discover and manage unexpected events.” This is an urgent requirement in the organizations generally studied in the HRO line of research—nuclear power, air-traffic control, aircraft carriers—because of the rigorous operational environment and the necessity of forestalling the interactive complexity and tight coupling (Perrow, 1984) that are conducive to “normal accidents.”

For Weick et al (1999), resilience is comprised of “coping skills,” and the “continuous management of fluctuations,” and they further elaborate on the related idea of improvisation as “the capability to recombine actions already in [the organizational] repertoire into novel combinations” (101). In addition, the ability of people or subunits of an organization to self-organize (they cite Rochlin, 1989 in calling these self-organizing systems “epistemic networks”) spreads problems around to a greater scope and range of expertise, thus boosting the chance of finding successful options. Weick et al note that (1999: 100) “This form of resilience materializes when events get outside of normal operational boundaries and knowledgeable people self organize into ad hoc networks to provide expert problem solving”.
"Ambivalence to past practice" is another aspect of resilience noted by Weick et al (1999). Here, the organization shows a willingness to overturn or bypass experience, knowing that the current troublesome situation, though similar to those encountered previously, may in fact have quite novel features that require inquiry and ingenuity in addressing. They cite Ryle’s (1979: 129) concept of response to the unexpected as “a union of some Ad Hockery with some know-how...the pitting of an acquired competence or skill against unprogrammed opportunity, obstacle or hazard.”

Weick’s virtual role systems, in which each member cognitively reproduces the organization, is what Comfort (1999) argues can be achieved by linking those cognitions by improved communications and imaging technology. The greater the number of linkages (Horne and Orr, 1998), the greater the number of communications transactions (Comfort, drawing on Habermas), and thus the more likely the development of a virtual role system: that is, an epistemic network that can respond when normal operations are disrupted. Comfort urges the fostering of responsive, adaptive behavior among organizations: to get them to create a shared vision of risk from their separate identities. In the same vein, Weick, Weick et al, Horne, and Horne and Orr want to enable an organization to maintain a shared vision among its constituent parts during times of crisis.

Though Weick et al (1999) deal with resilience as a feature of High Reliability Organizations, in their review article, they argue that the features of HROs that make them reliable need not be confined only to organizations that manage complex, dangerous technologies.

“High Reliability Organizations (HROs) have been treated as exotic outliers in mainstream organizational theory because of their unique potentials for catastrophic consequences and interactively complex technology. We argue that HROs are more
central to the mainstream because they provide a unique window into organizational effectiveness under trying conditions" (Weick et al, 1999: 81).

There is evidence, at least where resilience is concerned, that those principles, tenets, or broad themes are appearing in organizations other than typical HROs. The idea of resilience as adaptive behavior is being applied to the business environment in general; since some researchers and practitioners see that continuous change--shifts in information, technology, methods--is the prime challenge facing business, characteristics of resilience seem likely to enable those organizations to meet those challenges. Even corporations--organizations that might resist the descriptor postmodern--nevertheless recognize postmodern conditions: the absence of regular, linear changes of technology, ideas, connectedness, methods, replaced instead by sudden, discontinuous shifts and the destabilization of knowledge. Horne and Orr argue:

"Our modern concepts of change are rooted in Issac [sic] Newton’s view that the world and beyond were really a “great machine” challenging use to dissect its schematics and workings. About fifty years ago, other sciences began to abandon the hard-wired machine model of how things work in favor of a more fluid “connections perspective. The great machine gave way to the complex adaptive system with “constant change” as the primary principle for interpreting what occurs around us” (Horne and Orr, 1998: 29).

Mallak (1998) has applied Weick’s (1993) conception of resilience to hospital settings. He chose three dimensions of Weick’s conception: bricolage, virtual role systems, and wisdom, to explore resilience among health-care workers. While in the HROs that Weick et al (1999) studied, resilience was a feature needed to help forestall catastrophe, Mallak suggests that resilient behaviors should help facilitate other welcome outcomes, such as shorter hospital stays, improved treatment results, and lower costs. Mallak tested scales for measuring resilience through a survey of nursing executives. Factor analysis
results from that survey yielded resilience factors different from, but still analogous to, those discussed in Weick’s (1993) paper, and which are also broadly aligned with those reviewed in Weick et al (1999). These include the following: 1) **goal-directed solution seeking:** “goals and a vision to guide creative processes in seeking solutions to problems.” This factor is thus comparable to bricolage; 2) **Avoidance** includes “approaching new situations with skepticism.” Mallak notes that this is related to wisdom, but somewhat contrary to the idea of bricolage and that further research will be needed to reconcile what appear to be competing principles; 3) **Critical understanding** is the “effective use of information...to make sense of the situation when chaos ensues;” 4) **Role dependence** “is the ability to fill in for a missing team member,” which Mallak associates with Weick’s virtual role systems; 5) **Multiple source reliance** is the use of multiple sources of information to develop a coherent understanding of changing conditions; and 6) **resource access** is the use of tools or supplies as needed, even without securing permission each time.

Mallak (1998b) reiterated the importance of bricolage and virtual role systems but drew further lessons from psychology, in particular Werner’s study of resilience in children on Kauai. Thus Mallak’s conception of resilience focuses on individual characteristics rather than on organizations. For example, Mallak noted the importance of “self-efficacy” among resilient people. He defines self-efficacy as “the confidence in his or her ability to perform a specific task in a particular situation. This is the cognitive side of resilience; in resilience we are concerned not only with a person’s confidence and belief in his or her abilities, but with their actual execution of those abilities directed toward a specific problem.”
In other work, Mallak (1998b) elaborated additional resilience-enhancing principles: *perceive experiences constructively; perform positive adaptive behaviors; ensure adequate external resources; expand decision making boundaries* (a dimension analogous to Weick et al’s (1999) underspecified structures, or the application of Rochlin’s epistemic networks; *bricolage; tolerance for uncertainty* (that is, an ability to make good decisions when complete information is lacking); and *virtual role systems*; Mallak has interpreted this mean that the team can function “in the absence of one or more members,” which it surely does, but Weick envisages another meaning: a virtual role system isn’t significant only when someone is missing, but at all times, so that all members of an organization can simultaneously develop a shared vision of emergent challenges and ranges of action.

Horne (1997) has suggested that the machine metaphor which had guided conceptions of the organization--that of components functioning in a linear fashion amenable to prediction and therefore rational management--has given way to a more "organic" model that takes into account “linkages” within a system. Because the organizations which the organic model seeks to conceptualize are functioning in an unpredictable environment, traditional, anticipatory, “programmed” methods are no longer appropriate. That which cannot be anticipated cannot be planned for; rather, creativity and improvisation in the immediate response is required.

Some writers have taken up the concept of resilience and applied it to a broader scope of industries, such as in manufacturing. Horne and Orr (1998) identified seven “streams of resilient behavior,” which are generally analogous to those described by Weick and his associates. These include *community*; the sense of shared organizational
purpose; **competence:** appropriate knowledge and skills; **connections:** the relationships or linkages between the units of the organization; **commitment:** maintaining goodwill during times of uncertainty; **communication:** the sharing of information; **coordination:** synchronizing change; and finally, **consideration:** “the understanding by organizational leadership that change surrounds and interweaves into people’s lives such that small shifts in organizational activity may be perceived as “overload.”

One of the distinguishing features of HROs that appear repeatedly in the literature is their concern that novel, anomalous, or surprising situations may develop; by their nature, these highly unusual and perhaps unique situations are not amenable to unvarying procedures, checklists, or protocols. (This is not to downplay the importance of procedures in this literature; rather, the character of the procedures is important—some stifle resilience; others facilitate it.) A high reliability organization is one that exhibits resilience, among other qualities, in the face of unanticipated occurrences.

It is beyond the scope of this review of resilience to delve very deeply into the massive literature on the psychological aspects of an individual’s resilience to stressors. Nevertheless, it is worth pointing out that some aspects of creativity and resourcefulness will depend, in part, on individuals’ capacities, their ability to apply them, and also their belief in their ability to apply them. Some of the writing on resilience in the business literature has drawn on and adapted the work of psychologists, particularly those focusing on children and on families. In those studies, the goal is to determine why for example some children, who live in unpromising environments characterized by poverty or abuse are able to grow up without exhibiting destructive behavior, while others are not. The difference is attributed to varying degrees of resilience, which in turn is dimensionalized
into various factors, as in Sagor’s (1996) CBUPO conceptualization (competence, belonging, usefulness, potency, and optimism). Douglas Paton and colleagues’ work (for example Paton and Johnston, 2001) explores in more depth the relationship of individual psychological resilience to the ability to cope with disaster.

Much of the literature discussed above suggests that resilience should be seen not merely as the application of scientific knowledge and techniques, but also as an art. Weinberg (1986: 10), for example, argues that “Science deals with regularities in our experience; art deals with singularities.” What emerges from recent writing on resilience is a concept of resilience as the product of a kind of craft skill: an artistic interpretation and response to singular, unexpected, anomalous events as opposed to a rationalized predetermined response to what is regular. Achieving resilience thus requires a high degree of organizational craftsmanship, comprised in turn of individually-exercised craftsmanship: the ability to respond to the singularities in the interactions of social, technological, and natural systems requires artistry: a sense for what is the same and what is different from prior experience in every new experience, so that responses are continually adjusted; anomalies sensed, and learning occurs and that is incorporated into the next incremental unit of response. Meeting the vagaries of the operational medium and being prepared for sudden discontinuities require vigilance and the knack for combining experience with new learning.

**Resilience in New York City**
We do not argue that all of the aspects of resilience summarized in the foregoing section apply in New York: some of those conceptions are, if not contradictory, then at least poorly aligned with each other. Rather, we have tried to show linkages, similarities, and points of departure for recent thinking about resilience. We do argue that the emergency management organization in New York evinced many qualities of resilience and that, to the extent that those qualities can be reproduced elsewhere, other emergency managers might be able to enhance their capacity to respond to catastrophic events.

Although the emergency operations center was destroyed, the emergency management organization was not; rather, it exhibited resilient, adaptive behavior. When we arrived at the new EOC, some 96 hours after the attack, we found not a makeshift facility, but a two-city-block long space already half-filled with an expanding number of people, work-tables, copy machines, maps, charts, and computers (all networked and functioning): nearly two hundred computers, in fact, a number which was to grow during the period of our observations. The facility did lack the well-appointed furnishings of 7WTC and it did bear abundant evidence of its rapid assembly, but it was nevertheless a functioning, continually-maturing site for the performance of all necessary emergency management functions.

Drawing on several literatures, researchers at the Disaster Research Center (Kendra, 2001 MS; Tierney 2001 MS) have identified several dimensions along which resilience can be measured. These are robustness, resourcefulness, redundancy, and rapidity. It should be stressed that these metrics have a semi-subjective character; they are not empirical units but rather exist within certain definitions. We should also note that the metrics for resilience are not always synonymous with the features or components of
resilience which, when combined, generate the response effectiveness which it is desired to measure. Nevertheless, they help to frame elements of resilience for consideration.

Robustness refers to the strength of something. Whether the Twin Towers were robust can be debated. Published reports have indicated that they performed to their design criteria even when stressed by impact and fire much greater than anticipated (Roush, September 27, 2001 (http://www.techreview.com/web/special/roushe.asp. Viewed November 14, 2001). Nevertheless, there was not enough time to evacuate all of the occupants prior to the collapse. Indeed, evacuation of 7 WTC, which housed the EOC, was ordered after the second tower was struck. The EOC, with its steel framing and Kevlar-reinforced walls, was designed to withstand 200 mph winds (OEM, 2001), but would not have withstood an airplane strike. 7 WTC was severely damaged by the collapse of the towers, and itself collapsed later in the afternoon. It is not the intent of the paper to draw conclusions concerning the robustness of 7 WTC, but because of the early destruction of that building resilience in this case was overwhelmingly related to the dimensions of redundancy, resourcefulness, and rapidity.

Redundancy is the extent to which systems are duplicated, or components can be substituted, to maintain acceptable system function. Resourcefulness is the ability to apply creativity to identify new resources, to create resources from that which is thought to have no value. Rapidity is the ability to meet system goals promptly. The features of redundancy, resourcefulness and rapidity are well-illustrated in the re-establishment of the EOC. In addition, these events show the qualities of redundancy and resourcefulness to be strongly inter-related. Resources, and resourcefulness, can create redundancies that did not exist previously. For example, one of the major concerns with the increasing
technologization of emergency management is the possibility of over-reliance on those tools, so that if technology fails or is destroyed the response falters. To forestall this possibility, many planners advocate redundancy. In the World Trade Center attack, the EOC was completely destroyed; everything was lost. Emergency managers thus were faced with two requirements: new space, and new tools.

A pier on the Hudson River, which by amazing coincidence had been scheduled to be used for a bioterrorism drill on September 12, was leased for long-term usage. EOC staff then arranged for the accelerated delivery of hundreds of computers; these were installed and networked within 36 hours, with more arriving thereafter. The city has an ongoing contract for technical support from IBM; IBM thereupon donated $5 million of equipment and consulting services. With space as well as computing and communications equipment, EOC staff were able to establish a functioning replica of the old facility. There was no pre-existing redundancy for the EOC. Rather, with access to resources from within the city and relationships with the private sector, the Office of Emergency Management created redundancy on the fly. Obviously, one source of this enormous capacity for resilience inheres in the City itself. New York City alone, even without recourse to external sources of assistance, is a world-class metropolis with immense capacity, with emergency services departments equaling the population of a small city, and a resident citizenry possessing every art and talent.

New York was also the focus of an outpouring of support which further enhanced its resilience. Resources of nearly every description arrived, with convergence becoming at times a management problem in itself. This convergence of volunteers and equipment is well-documented in reports of other disasters as well (See, for example, Neal, 1992,
In terms of the community aspect of resilience, New York participated not only in formal mutual aid agreements, but also there was a network of personal contacts between the emergency managers in OEM and their colleagues in other nearby communities. They knew each other and often attended meetings and conferences together, and thus they were able to ask for and give assistance more readily. For example, personnel from nearby Nassau County worked at the logistics station, augmenting the existing staff. Police officers from New York State Police and from Connecticut staffed barricades and check-points. National Guard personnel and police from well beyond the city’s borders – from across the country – also arrived to provide help in a similar capacity. The role these assisting officers and military personnel played enabled New York City’s officers to work at tasks requiring more local knowledge. Such manufactured redundancy was not limited to the police force but seen in a variety of areas such as logistic offices and fire departments.

Another large source of personnel were the Red Cross volunteers who served hot meals (prepared by a commercial caterer) in the EOC and in respite facilities established close to Ground Zero – at first near front staging area in outdoor tents and then later at the Marriott Financial Hotel and St. John’s University. In these respite centers established at the latter two facilities were cots, easy chairs, showers, dining halls, televisions, and computers with Internet and email access. They also provided such services as massages and chiropractic care, counseling, and first aid. Urban Search and Rescue teams arrived from across the United States. Motorola and Nextel supplied hundreds of radio-telephones. Other Hudson River piers were pressed into service for FEMA office space and the establishment of the Family Service Center, where relatives of victims and
survivors displaced from their homes or jobs could find assistance on the many administrative processes. New York City and Company, the visitors’ bureau, helped volunteer and other relief workers find accommodations. Hewlett Packard, ESRI, and professors and graduate students from local colleges – among others, supplied GIS support and equipment. A complete listing of supplies and services donated to or purchased by New York City would fill many pages, but other resources of personnel and equipment purchased or donated included large quantities of office supplies; volunteer chiropractors; donations of clothing; medical supplies; and personal-care products (toothbrushes, toothpaste, combs, socks, underwear, contact-lens solution, tissues), many of which were laid out for the taking in the EOC. At first only snack foods were available, and donated baked goods, but the food service component evolved to the provision of hot meals (with two entrees). A dining area was contrived, first with simple folding tables but soon expanding to include café tables, table-cloths, floral centerpieces and later holiday decorations, cold-drink coolers, and other restaurant accoutrements. As these examples suggest, a large influx of materials can, at least in some instances, counteract the lack of redundancy.

Mirroring the original EOC, which was organized by function into working modules called pods (for example, the transportation pod contained agencies such as the Coast Guard, transit services, and so on), they established comparable pods at the new EOC. It is important to stress, particularly in terms of the resilience dimension of rapidity, that the improvised EOC that was set up within 48 hours of the attack was already twice the size of the original, both in size and in terms of the number of organizations represented and computers involved. Over two hundred fifty computers and a comparable
number of organizations were eventually present in the EOC, and some 700 people worked there or passed through during the day. One senior EOC official said, in fact, that they would have been unable to manage the event entirely from 7WTC even if it hadn’t been destroyed.

Since none of its regular personnel were lost, OEM did not need to draw upon virtual role systems to achieve resilience. None of the regular staff was killed, though some were injured and at least one was missing for several hours. OEM was able to preserve its organization, even though it had to reconstitute that organization in an entirely new location. OEM’s creativity lay not so much in creating something new, but rather in reproducing what it had lost: the familiar sociotechnical system in which personnel had worked and trained in previously. Physical elements of the EOC, such as the workgroup pods, the podium, the raised platform for the watch officers, were replicated. The ability to establish that level of familiarity facilitated the maintenance of the kind of shared vision which most researches agree is important to a resilient organization and in this case, a resilient community. OEM didn’t merely use what it already knew; it drew on resources to create a situation in which it could duplicate familiar operational patterns. Rather than abandoning existing procedures, OEM created the operational context for maintaining them. Training, frequent drills, and exercises that often involved the mayor developed a capacity for adaptive behavior that was not dependent on technological systems. “It [the organization] was in my head,” said one senior official. OEM thus created, not a new “shared vision,” but the means of preserving that vision that had guided its activities prior to September 11.

References


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