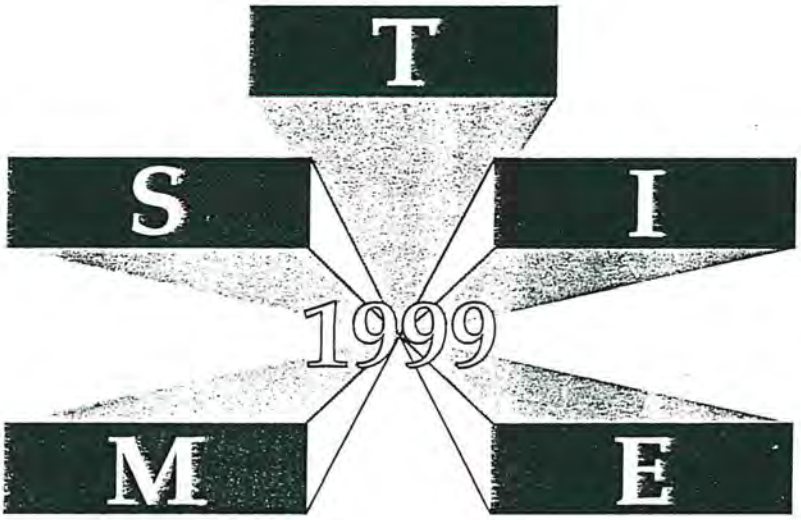
Contingency, Emergency, Crisis, and Disaster Management: Defining the Agenda for the Third Millennium



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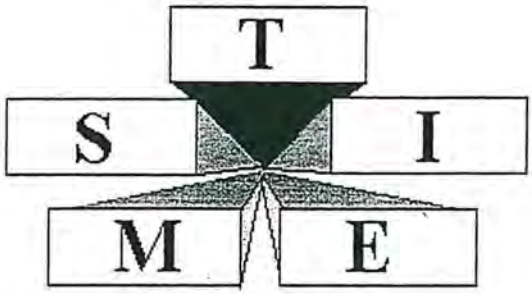

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Issues Regarding the Safety and Health of Emergency Workers

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Abstract
Emergency personnel, like all workers, carry out their duties within an environment composed of a set of elements. First, there is the emergency itself. Whether it is a forest fire in France, a tornado in the American Midwest, or a mining disaster in Russia, the emergency imposes certain exigencies upon the responders. Second, there is a social structure with specific social units, rules, and forms of association. An emergency response, therefore, takes place within a context of prescribed behaviors, expectations, and value judgments that may sometimes be in conflict. Third, there is a technology that must be dealt with in order to accomplish group goals. If the technology itself is implicated in the emergency, such a circumstance may impact the entire emergency environment. It can be seen that a breakdown in any of these elements could result in worker injury, but also might well lead to heighten responder stress. This paper discusses how workers not only get injured but may come to experience burn-out, post-traumatic stress syndrome, or impaired work and family relationships even though their normal work setting (the emergency) is expected to be "abnormal." The authors suggest aspects of each of the three environmental elements that may deserve further inquiry.

Keywords: emergency workers; occupational safety and health; work organization and environment

Introduction

There are many components of a successful emergency management effort. Consequently, a holistic, multi-dimensional model is needed to identify and inter-relate the various aspects of pre-disaster, disaster, and post-disaster response. The emergency manager and worker have strategic roles and are in key positions. They are also exposed to potential injury and loss of life. Perhaps as important, they may be required to perform arduous physical tasks and deal with emotional situations like rescue work or body recovery. The nature of these situations prompted the authors to examine some emergency worker safety and health issues within the context of their work environments.

The authors first offer a discussion of these *environments*. Secondly, the human/environment interface is presented in a brief synopsis of the *human response under stress*, which precedes a brief review of the *latest research* in this area. The goal of this paper is to promote thought and discussion about emergency workers, their environments, and their safety and health. The Critical Incident Stress Management (CISM) model will be presented as an example of a multi-dimensional *intervention* focused on the safety and health of emergency workers. Finally, the

authors will suggest aspects of each of the three environments that include areas for *further study.*

The Disaster Work Environment

A disaster scene, such as a fire underground, is a dynamic work setting. As such, it presents workers with a need to continually adapt to their physical environment. At the same time, they must adhere to the formal and informal expectations of their organization. Their organization, in turn, is an open system that must be responsive to its organizational environment. Pasmore and Sherwood [1] suggested that a situation like this would lead to a gross increase in an organization's area of relevant uncertainty. Values are instilled and rules promulgated to shore up this uncertainty. These rule "enactments" in Weick's [2] term, are likely to be oriented toward organizational cohesion rather than toward individual affect. This condition gets translated into cultural attitudes that show up in the form of policy letters, directives, memos, and other organizational manifestations. There appear to be at least two implications for the safety and health of emergency workers.

First, official directives may be instrumental but potentially dangerous when put into practice. Hart [3], in referring to the South Canyon fire near Glenwood Springs, Colorado, noted that the Grand Junction District Management Team directive stated all fires should be "initially attacked and suppressed as soon as possible." From an organizational perspective that is a functional cultural attitude. The firefighters' roles are unambiguous, and other organizations in the environment (such as town councils or timber companies) would see that approach as in their best interests. From the workers' perspective, such a cultural attitude would reinforce the sense of solidarity that characterizes groups in dangerous work settings [4]. In other words, the need to enhance interpersonal predictability can be achieved through a like-minded sharing of group core values. Unfortunately, an organizational gung-ho attitude can have deleterious consequences. It is easy to lose sight of individual needs in pursuit of the organizational mission. Karl Weick [2] in referring to the general wild land firefighters' guidelines called "Watch Outs" suggested there should be a set compiled for administrators. First on this list would be "Watch Out when the governor is in town." In other words, when high ranking officials are present, the organizational mission is likely to be pursued zealously at the expense of individual needs.

A second problem with the composition of emergency organizations is that they, like other formal organizations in society, are designed to be instrumental. Because of their basic mission-oriented structure, there is little provision for affect. Thus, even when it becomes apparent that the human factor should be included to achieve organizational effectiveness, change is not easy to foster. Perhaps the most basic barrier to change is that those who inhabit an organization have internalized the very principles that undergird contemporary organizational forms. These principles, taken from the industrial era and mechanical in nature, evoke such notions as speed, reliability, and efficiency of operation. There is scant allowance for people in this milieu. A second barrier, related to the one above, regards organizations' interlocking networks of divisions and functions. Because of the way they are structured, non-instrumental activities (or those seen as non-instrumental) can be shunted into "staff" status. Those who are outside the line functions have a different command structure, are valued differently from an organizational perspective, and have a differential ability to impact the organization. Thus, many of the affective innovations that can be shown to enhance organizational functioning are grafted on rather than integrated into the organization's structure.

As the authors suggested in their treatise presented at the 1995 TIEMES Conference in France [5], the behavioral science disciplines are important to emergency management planning and engineering. Knowledge in the social sciences can provide empirical information, not only on general human response patterns, but about individual and group behavior during emergencies. This information might mitigate safety and health factors for emergency workers, resulting in fewer injuries and fatalities. Such knowledge could also lessen longer term consequences such as burnout or post traumatic stress symptoms which can lead to Post Traumatic Stress Disorder (PTSD).

Human Stress Response

The stress response is a normal human reaction to a stressor. It is also sometimes referred to as the "fight or flight response". In a threatening situation, the body prepares to fight or run. Thus, this response may be thought of as a survival mechanism. The stressor may be biogenic (physical) or psycho social (emotional). Biogenic stressors include stimulants such as nicotine, amphetamines, phenylpropranolamin, therphyline and caffeine. Psycho social stressors are described as environmental events in which an individual's interpretation plays a key role in triggering the stress response. Regardless of its source, the physiological response brings about dry mouth, sweaty palms, and cessation of digestion. Additionally there are increases in heart rate, temperature, respiration, and visual acuity. Finally, blood moves to the skeletal muscles. The body prepares to fight or to run.

A normal scenario would include the decision to fight or run, execution of that decision, resolution, and return to a normal baseline until the next stressor arises. The stress response is a primitive human reaction. Unfortunately, in today's world the stessors continue, overlap, and do not provide for a "down time" or return to a baseline. This is particularly relevant in an emergency response situation where the stress is ongoing, and may be viewed as chronic. In fact, the high level of stress may be viewed as having become a part of the socio-technical system. This impacts emergency managers, workers, and victims, not only during the present disaster but cumulatively.

Recent Research

An international conference was held during March, 1999 in Baltimore, Maryland U.S.A. Entitled Work, Stress and Health '99: Organization of Work in a Global Economy [6], it presented the latest global research dealing with exposure to stressful situations. Thus, we are provided a current picture of thinking about human response.

Overall, work stress may increase an individual's risk of injury, cardiovascular disease, psychological disorders and other health problems. Stressful working conditions are also associated with increased disability claims, absenteeism and tardiness. An overload of stress can result in burnout, which may manifest itself in emotional and physical exhaustion, emotional withdrawal, depersonalization, and aggressive tendencies. The Japanese even have a specific word for brain and heart disease through overwork - *karoshi.* Overload, fatigue and varying work schedules, all relevant to the worker in an emergency, can lead to unrealistic expectations and the constant demand for high performance. Coupling this with a lack of resources, not uncommon in an emergency situation, particularly in the first hours and days of a disaster, and the risk to the emergency manager and worker safety increases.

It was noted at the Work, Stress and Health'99 Conference that studies showed 90% of disaster victims exhibit some of the symptoms of post traumatic stress disorder (PTSD), most commonly defined as intense psychological distress at exposure to events that symbolize or resemble an aspect of a traumatic event. These symptoms include: difficulty in concentrating, headaches, nervousness, nightmares, difficulty falling or staying asleep, loss of appetite, anxiety, depressions, helplessness/hopelessness, irritability or outburst of anger and feeling of detachment from others. Studies on emergency workers indicate similar symptoms but the percentage of the population suffering has not been extrapolated.

A study of firefighters in Germany [7] suggested that specific activities resulting in maximum stress included, first of all, the rescue of children. Other studies of emergency workers (police, hospital emergency personnel) suggest that the number one stressor is disasters in which children have been injured or killed. In addition, age is a factor in determining the measurement of stress for firefighters. Von Hallmeyer et al [8] found that as firefighters became older and more experienced, they perceived the risks differently and more negatively. Preuss et al [7] found no significant correlation between age, experience, and level of perceived strain, but did find that highest stress, for the firefighters in their study, was related to rescue operations. In other words, emergency operations dealing with fatalities or injured people are viewed as most stressful. Stress could be present in two of the three environments in which emergency workers must function: the circumstances of the emergency itself, and their social environment.

Another dimension of stress concerns intentional and unintentional technological disaster. Intentional man-made disasters have increased in the past several years, and emergency managers and workers need to be aware to this trend. Intentional disasters include terrorism, which is on the rise globally. The subway chemical release in Japan is an example, as is the Oklahoma City bombing in the United States. In fact, the Associated Press noted that the 1995 bombing sparked a wave of right-wing terror that has led to an alarming growth in the anti-government movement, according to a report by an organization that monitors hate groups. The Southern Poverty Law Center's Intelligence Project said that the FBI was investigating about 100 domestic terrorism cases before the April 19, 1995 bombing of the Alfred Pl Murrah Federal Building. According to SPLC, the FBI three years later was working on more than 900 such cases. A spokesperson for the FBI, in Washington, D.C. would not confirm the number but indicated that there "has been an increase." If intentional disasters continue to escalate, there should be increased evaluation of different environments with respect to the safety and health of emergency workers.

Interventions

With the complexity of emergency management, a comprehensive, multi-component, multi-discipline intervention is appropriate. The world's most widely used crisis intervention system is the Critical Incident Stress Management (CISM) model [9]. This model is an example of the many facets that must be included in an intervention aimed at insuring the safety and health of disaster workers. The US Occupational Safety and Health Administration recommends that multi component crisis intervention programs be established in healthcare institutions, social service agencies, and even in convenience stores [10] [11].

CISM has been adopted by diverse organizations in a wide variety of workplace settings. These include the Federal Aviation Administration, the US Secret Service, the Federal Bureau of Investigation, the Airline Pilots Association, the US Sir Force, the Swedish National Police, the Association of Icelandic Rescue Teams, and the Australian Navy.

CISM is a multi-factor, integrated crisis intervention system that spans the entire temporal spectrum of a crisis. CISM interventions range from the pre-crisis phase through the acute phase, and into the post-crisis phase. It consists of interventions that may be applied to individuals, small functional groups, large groups, families, organizations, and even communities. The seven core components of this program are presented in Table I as an example applicable to the environments in which emergency workers function. Everly and Mitchell [12] note that these interventions are not typical mental health counseling methods. They caution that these interventions are not to be viewed within the typical mental health model. These are normal people subjected to abnormal circumstances. Specialized training is needed to administer the CISM program.

Future Directions

In conclusion, the authors suggest some research that might be conducted within each of the defined environments:

1. *The emergency environment itself*

Most research has been conducted on specific disasters or emergency situations. There should be follow-up research on individual emergency workers who have been exposed to a number of emergencies over time. This could provide information about cumulative effects on the worker.

2. The social environment

The sometimes inherent conflict between emergency manager directives ("put out the fire") and their potentially dangerous consequences to the worker needs further investigation. The authors noted that change is not easy within this context or within the larger organizational framework. Many times, consideration of the human factor is an "add on" in emergency management before, during, and after a disaster.

3. Technological environment

The part technology plays during an intended or intended disaster may have serious consequences to the safety and health of both managers and workers.

TABLE 1

CRITICAL INCIDENT STRESS MANAGEMENT (CISM): THE SEVEN CORE COMPONENTS
(Adapted from: Everly and Mitchell, 1999)

INTERVENTION	TIMING	ACTIVATION	GOALS	FORMAT
1. Pre-crisis preparation	Pre-crisis phase.	Anticipation of crisis.	Set expectations. Improve coping Stress mgmt.	Groups. Organizations.
Large Groups: 2a. Demobilizations & Staff Consult. (rescuers); 2b. Group Info. Briefing for schools, businesses and large civilian groups.	Shift disengagement; or, Anytime post crisis.	Event driven.	To inform, and consult. To allow for psychological decompression. Stress mgmt.	Large groups. Organizations.
3. Defusing	Post-crisis. (within 12 hrs)	Usually symptom driven.	Symptom mitigation. Possible closure. Triage.	Small groups.
4. Critical Incident Stress Debriefing (CISD)	Post-crisis. (1 to 10 days); At 3 - 4 weeks for mass disasters.	Usually symptom driven. Can be event driven.	Facilitate psychological closure. Sx mitigation. Triage.	Small groups.
5. Individual crisis intervention (1:1)	Anytime. Anywhere.	Symptom driven.	Symptom mitigation. Return to function, if possible. Referral, if needed.	Individuals.
Systems: 6a. Family CISM; 6b. Organizational Consultation.	Anytime.	Either symptom driven or event driven.	Foster support, communications. Symptom mitigation. Closure, if possible. Referral, if needed.	Families; Organizations.
7. Follow up; referral.	Anytime.	Usually symptom driven.	Assess mental status. Access higher level of care.	Individual. Family.

[From: Everly, G. & Mitchell, J. (1999) Critical Incident Stress Management (CISM): A New Era and Standard of Care in Crisis Intervention (2nd Ed.). Ellicott City, MD: Chevron Publishing.]

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Biographies

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