

A MISSING COMPONENT IN YOUR EMERGENCY MANAGEMENT PLANS: THE CRITICAL INCIDENT STRESS FACTOR

Kathleen M. Kowalski, Ph.D.
U.S. Bureau of Mines
P.O. Box 18070
Pittsburgh, PA 15236

ABSTRACT

In emergency management, the effects of stress on the performance of emergency personnel, typically have been ignored or regarded as too enigmatic to quantify. This paper discusses the concept of Critical Incident Stress in responders to emergencies. It presents the rationale for considering stress as a significant factor in the management of emergencies. It is proposed that Critical Incident Stress Debriefing in a disaster can improve the effectiveness of response teams on site, their turnaround time on site, and post-disaster time off the job. Critical Incident Stress intervention also can mitigate potential deleterious emotional effects associated with emergency work. This paper, prepared by a U.S. Bureau of Mines researcher, offers some ideas to the mining industry in general, to mine rescue team trainers, and to developers of program simulations on the specific issue of how people, time, materials and space may be factored into a plan for emergency management. The impact of stress on emergency workers is presented as a missing component in present emergency management models.

INTRODUCTION

A main focus in the management of emergencies has been on resources and logistics, on providing the necessary resources to meet a crisis within an urgent time frame; in other words, having **what** and **who** you need, **where** and **when** you need it. The necessary resources include trained manpower, appropriate equipment, available communication, plus knowledgeable and decisive leaders. In the mining industry,

emergency response planners have concentrated on designing better and safer equipment, on producing rescue apparatus such as the person-wearable, self-contained self-rescuers, on decreasing response time, on increasing training of mine rescue teams, and on developing escape plans that comply with mine safety regulations. Mining operators must develop escape plans that are designed to comply with regulations under 30CFR Part 75 (sec 1101-23 and 1704-2).

Immediate and appropriate response to mine disasters is, of course, essential. "Longer hoses and higher ladders" are important. New technology and increased training improves the efficiency of the rescue worker. An often missing consideration in mine and other disaster training and management programs however, is the impact of stress on the emergency workers themselves. This paper offers information and proposes how the effects of human stress on emergency/rescue workers may be factored into emergency management planning.

THE RATIONALE FOR INCLUSION

The stress response is a normal human characteristic, an adaptive preparation for action by humans in crisis. The human organism survives because of the maintenance of a normal internal balance referred to as homeostasis. A physical or psychological threat tends to disrupt homeostasis and produce physiological reactions in the body. These physiological reactions involve the nervous and endocrine systems and produce various system, and organ responses. Specifically, stress leads to activation of the autonomic nervous system and to an increase or

decrease in secretions of various hormones in the body. (1)

The response to a perceived threat or danger is sometimes referred to as the "fight or flight" response. When we are under duress our hearts beat faster and blood is diverted to the skeletal muscles; one may faint from shock; temperature, blood pressure and respiration rate remain high; there is a sudden outpouring of hormones; the throat becomes dry, digestion stops and the eyesight improves. (2, 3) This response was useful to our early ancestors in their efforts to survive dangerous animals, human enemies, and other conditions of primitive environments. It was helpful when they ran into a tiger in the jungle; they prepared for action and responded (hopefully they ran!) and the body returned to normal until the next tiger, which might be days or weeks or even months later. In today's societies, the dangers may differ but can be equally severe and more complex. Modern humans are besieged with overlapping stressors and the constant response to them creates wear and tear on the mind and body.

The National Institute for Occupational Safety and Health identifies occupational stress as one of the principal social and occupational health concerns of the 1990's. In response, NIOSH has developed a multipoint strategy for control of stress in the workplace and has joined forces with the American Psychological Association to translate the strategy into practical action. (4)

The National Council on Compensation Insurance notes that excessive stress accounts for about 14% of all occupational disease compensation claims. (5) The amount per claim averages \$15,000, almost twice the average amount paid per claim for workers with physical injuries. The number of stress-related worker compensation claims being filed across the country is skyrocketing. The U.S. Department of Commerce in 1990 reported that the claims nearly doubled from \$13.6 billion in 1980 to \$24.7 billion in 1987 and are expected to top \$90 billion by the turn of the century. (4) Work-related stress claims are the fastest growing and most costly per incident among claims affecting American commerce. (6)

The Northwestern National Life Company reported that six percent of its disability cases were stress related in 1982; that number had become 13% by the end of 1990. The total financial cost of extreme stress to business and industry is difficult to document but estimates place it between \$100 and \$150 billion per year; 600,000 workers moreover, are disabled each year for reasons of psychological disorders. (4)(7)

Some workers, through conditions or choice of occupation, place themselves in stressful situations at a higher frequency rate than other workers. Emergency personnel such as mine rescue teams, firefighters, police, hospital emergency room personnel, EMTs and workers called on to respond to disasters fall in this category. These workers are at high risk to experience disabling occupational stress reactions and, at the extreme, for a diagnosis of Post Traumatic Stress Disorder (PTSD). (6)

PTSD is considered to be the most severe and disabling variation of occupational stress.(8) The general public became aware of Post Traumatic Stress Disorder after the Vietnam War, when soldiers were reporting symptoms of a duration and intensity that called for medical intervention. PTSD is a medical diagnosis recognized in 1980 by the American Psychiatric Association and described in the DSM IIIR, the medical diagnostic manual for psychiatric disorders. Symptoms associated with PTSD include flashbacks or nightmares, reliving of events, exaggerated startle responses, sleep disturbances, detachment or avoidance of close, interpersonal relationships, feelings of guilt, high levels of anxiety and depression, and impairment of concentration and memory. (9)

The risk of becoming a victim of PTSD is mostly an outcome of having been in a high-risk, potentially traumatizing situation or experience. Individuals in high-risk populations such as emergency service professions are at higher than normal risk for PTSD. In an epidemiological investigation conducted by Helzer et al. it was discovered that the prevalence of PTSD in the general population of the United States was about

1 - 2% (10). The general statistical risk of PTSD, however, can be misleading. For those in high risk professions, any single traumatic incident may engender symptoms of post-traumatic stress or fully developed PTSD, at an incidence up to 90% or more in those who are primary or secondary victims. (8)

By definition, a traumatizing event is one that is outside the normal range of everyday life events. It is experienced by the individual as overwhelming. (11) Traumatizing events or **critical incidents** are especially frequent among emergency workers. A critical incident is one experienced by personnel that produces an emotional reaction with the potential for inhibiting a worker's ability to function either at the scene or later. (12) An example of a critical incident would be the serious injury or death of a colleague in the line of duty or an incident where the circumstances, the sights, sounds and smells are so distressing as to result in an immediate or delayed reaction. (12)

Researchers have identified both immediate and long range symptomatic reactions to trauma. (11) Initially, individuals will report numbness, denial, avoidance of places or things that remind them of the trauma, withdrawal from social interaction, depression, difficulty with concentration and relationships. Long range, more acute symptoms include fearfulness, irritability, sleep disturbance, flashbacks and heightened sensitivity. These responses can fluctuate within an individual and be confusing and disturbing. Although researchers and psychologists who specialize in job stress generally agree that persons attracted to emergency work are, as a group, basically more emotionally stable than the general population, emergency workers, however are subject to an increased incidence of stress-related diseases such as heart disease. (13)

Generally, emergency workers close ranks after a crisis. They prefer to talk to others in their unit or on their rescue team. Telltale signs of distress such as excessive humor, increased derogatory remarks against one another,

irritability, withdrawal from others or significant changes in behavior are often overlooked by peers. Post trauma reactions are natural - though not necessarily healthy - responses to trauma, and they can be resolved. There is consensus among clinicians and researchers that the presence of a supportive environment is crucial to a positive resolution for the traumatized worker. (11) Successful resolution of the crisis experience not only allows for the worker's return to productive work but can help him or her better understand a

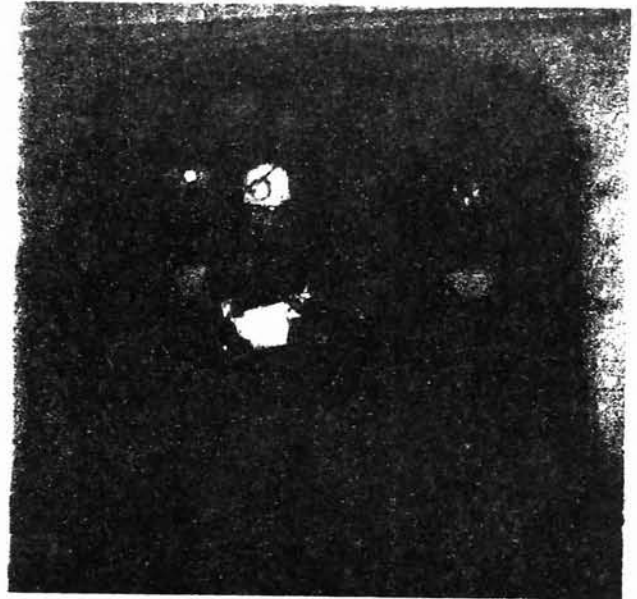


Figure 1.--Miner's escape through smoke

normal response to an atypical situation. Emergency Service personnel generally are normal individuals responding to abnormal situations. Critical Incident Stress Debriefing is an organized approach to the management of the stress reaction.

BACKGROUND

Throughout history there are references to human stress in traumatic situations. According to Mitchell, Critical Incident Stress Debriefing intervention evolved from four major influences: military experiences, police psychology, emergency medical services and disasters. (14) Mitchell noted that stress reactions during war have been reported by historians since 603 BC.

Thousands of combat stress victims were reported during the American Civil War and among American service personnel in the two World Wars.

Police psychologists entered the emergency services in the mid 1960's and they have contributed knowledge about the personality profile of the emergency worker and recommendations concerning the provision of psychological support services. Emergency medical services agencies began developing support services in 1972; the first programs were in trauma centers and large hospitals. (14)

In 1983, after nine years of ground work, Mitchell introduced Critical Incident Stress Debriefing (CISD). He formed CISD teams made up of trained mental health professionals and specially trained peer support personnel drawn from the ranks of the emergency service. In a 1985 survey of 360 emergency workers from four states, 87% of the emergency responders stated that they had been emotionally and physically stressed by their work; 93% felt that the debriefings were helpful. (15)

INTERVENTION

A Critical Incident Stress Debriefing team is peer-driven and guided by a mental health professional. It's work is confidential. CISD teams function in three areas: pre-incident, incident, and post-incident. (16)

CISD Pre-incident

The pre-incident functions are important and are mainly educational. Included are instruction on stress recognition and stress reduction and the differences between non-emergency stress and critical incident stress. Instruction is provided to both the workers and the management\command staff. Emergency managers need to be included in the instruction and become informed about the capabilities and the limitations of CISD Teams and how to initiate services.

Stress management protocols for use during

an incident can be invaluable. They provide guidelines for optimal length of work time, frequency of rest periods, maximum time at the scene, food, shelter and use of a CISD team. In addition, the provision for spouse and family education programs can provide significant support to the emergency worker.

This first phase of the program, focused on education, is a key component of the intervention. The more information people have about stress the better they can recognize it in themselves and others, and seek help. Pre-incident education can lessen the need for the allocation of greater resources for post-incident rehabilitation. (14)



Figure 2.--Donning SCSR's

CISD During an Incident

During a critical incident, a debriefing team provides on-scene assistance to personnel who are obviously distressed. The team also may provide "defusings" which are shorter, unstructured debriefings that encourage a brief discussion of the events. These can significantly reduce acute stress. This intervention is done one to three hours following the event and may last up to one hour. If a defusing is not achieved within twelve hours, a full formal debriefing within three days of the incident is recommended. In large disasters, where many people are involved, after a unit disengages from the scene the participants

meet with mental health professionals and are given information on the typical effects of critical incident stress and the symptoms which may or may not appear. They are given practical suggestions for stress management and allowed time to comment or ask questions.

Post-incident CISD

For about 24 hours after an incident is over and defusings or demobilizations are complete, emergency personnel typically prefer not to discuss the event with outsiders. Emergency personnel may focus on reports and procedure, not being ready to deal with their feelings about the event. (15)

As stated earlier, CISD is a psychological and educational support group discussion that utilizes a specially trained team composed of a mental health professional and peer support personnel. A CISD team after a mining disaster would be composed of a mental health professional and mine rescue team members who have been trained in CISD. The CISD is a carefully designed, structured process that progresses through seven phases and provides stress-reduction information. Participants are encouraged, but not required, to speak; the process is confidential. (16)

Responders to emergencies are not always trained or experienced personnel. Sometimes they are individuals who simply are "there" and enlisted to perform a task. In a mine fire, rank and file miners from other areas may be called upon to execute emergency assignments and consequently be exposed to critical incidents. An example of this assumption of roles in an emergency, is found in a U.S. Bureau of Mine's case study of workers' escape from an underground mine fire (17). The fire was discovered by the "fire boss" (mine examiner) who disengaged the trolley power and called to warn the shift foreman and the miners working in the three sections which were affected by the fire. The fire boss, joined by the mine foreman and the general assistant foreman fought the fire and extinguished it about an hour after discovery. Meanwhile, twenty-some miners escaped under smoke. There was no time for a mine rescue

team to organize and respond. The individuals on the scene reacted to fight the fire and to execute the escape. All individuals called upon to fulfill emergency roles should be included in debriefings.

Follow-up

All defusings, demobilizations and debriefings are followed up in some manner ranging from a phone call to a follow-up meeting. A CISD team must be trained. It takes a special task force six months to a year to organize a CISD team. They need to be carefully recruited, trained, and committed to the process. (14)

FURTHER INFORMATION

Critical Incident Stress Debriefing teams have grown remarkably in the past ten years. The Second World Congress on Stress Trauma and Coping in the Emergency Services Professions, held in 1993 in Baltimore, MD attracted attenders from all over the United States and abroad. In January of 1994 there were approximately 350 CISD teams worldwide. (18) The studies cited here suggest that those responsible for the development and implementation of crisis management plans need to be aware of the importance of including resources for meeting the critical incident stress potential for their rescue workers. They emphasize the importance of the intentional creation of pre-incident education programs and a post-trauma workplace milieu that is conducive to healthy resolution of the trauma.

Management personnel are not exempt from critical incident stress syndrome. As reported by Doepel, managers are vulnerable to traumatic stress reactions and need to be offered training and information with the rest of the emergency personnel. (11) His experience suggests that management, whenever possible be involved in the group process. He concludes that a good emergency plan "is enhanced by the inclusion of components designed to mitigate the effects of post-traumatic stress reactions among managers and employees" (11 p. 186).

The following are steps for incorporating the human stress factor in emergency/rescue work into an emergency plan:

1. Develop a collaboration between mental health personnel and emergency service personnel. Mental Health personnel should be included in emergency planning. (19)
2. Develop an educational program for workers and their families including information on critical incident stress and interventions. (14) Include workers and managers in your program. (11)
3. Allocate resources, time and space for a debriefing process to be conducted by trained personnel. (14)
4. Provide for follow-up and support after the event.

CONCLUSION

This paper has considered the human stress factor in the work of emergency personnel and discussed its history and interventions. Data needs to be collected in this area. The following are some of the topics for further research and development: comparing personnel exposed to CISD with those who are not; tracking illness and job absenteeism before and after an event; and formulating training programs for specific populations, such as high risk mine rescue crews.

Quarantelli noted in the research, that we are far from certain how much any of us understands about the nature of disasters, the nature of mental health and the relationship between the two.(20) The initial step is to recognize how significant that relationship may be.

REFERENCES

1. Asterita, M. F. *The Physiology of Stress*, Human Sciences Press, Inc. New York, 1985. 264 pp.
2. Myers, D. G. *Psychology*, Third Edition, "Stress and Health", Worth Publishers, New York. pp. 513-514.
3. Selye, H. History of the Stress Concept, in *Handbook of Stress Theoretical and Clinical Aspects*. L. Goldberger & S. Breznitz (eds). The Free Press, Macmillian, Inc. 1993. pp. 7-20.
4. Keita, G. P. & Sauter, S. L. Eds., *Work and Well Being, An Agenda for the 1990s*, American Psychological Association, Washington DC, 1992. 227 pp.
5. McCarthy, M. (1989, April 7) Stressed Employees Look for Relief in Workers' Compensation Claims. *Wall Street Journal*, 34 pp.
6. Everly, G. S. & Mitchell, J. T., *The Prevention of Work-related Post Traumatic Stress: The Critical Incident Stress Debriefing Process*. Paper presented at the Second APA and NIOSH Conference on Occupational Stress, November 19-22, 1992 Washington, D.C. unpublished.
7. Miller, A., et al., *Stress on the Job*. *Newsweek*, 1988, April 25 pp. 40-41.
8. Everly, G. S., *A Clinical Guide to the Treatment of the Human Stress Response*. New York:Plenum Press. 1989.
9. Rundell, J. R., Ursano, R. J. Holloway, H. C. and Silberman, E. K., 1989. *Psychiatric Responses to Trauma*. Annual Meeting of the American Psychiatric Association, Washington, D.C., 1986. *Hospital and Community Psychiatry*, 40 (1):68-74.
10. Helzer, J., Robins, L. & McEvoy, L. Post-traumatic Stress Disorder in the General Population. *New England Journal of Medicine*, 317, 1987, pp. 1630-1634.
11. Doepel, D. G. *Crisis Management: The Psychological Dimension*, *Industrial Crisis Quarterly* 5, 1991, pp. 177 - 188.
12. Mitchell, J. T., *When Disaster Strikes...The Critical Incident Stress Debriefing Process*, *JEMS* January 1983 pp. 36-39.
13. Dunning, C & Silva, M. *Disaster-induced Trauma in Rescue Workers*. *Victimology: An International Journal* 5 1980,(2-4): pp. 287-297.
14. Mitchell, J. T., *Stress, The History, Status and Future of Critical Incident Stress Debriefings* 1988 *JEMS*, pp. 47-52.
15. Mitchell, J. T., *Helping the Helper, Role Stressor and Supports for Emergency Workers*, *Center for Mental Health Services*, 1985, pp. 105 -118.
16. Mitchell, J. T., *Development and Functions of a Critical Incident Stress Debriefing Team*. *J. of Emergency Medical Services* 13, 1988, pp. 43-46.
17. Vaught, C., Mallett, L., & Brnich, M. *Judgement and Decision Making in a Mine Fire: A Case Study*. Paper presented at the Ninth U.S.-Korea Joint Workshop on Coal Utilization Technology. San Francisco, California. October 18-20, 1992.
18. *The International Critical Incident Stress Foundation, Inc.* Dorsey Hill Drive, Suite 102, Ellicott City, MD 21042
19. Hartsough, D. M. and Garaventa-Meyers (Eds) *Disaster Work and Mental Health Prevention and Control of Stress Among Workers* Washington, D.C. Center for Mental Health Studies of Emergencies U.S. Department of Health and Human Services, 1985.
20. Quarantelli, E. L. *An Assessment of Conflicting Views on Mental Health: The Consequences of Traumatic Events*. In Charles R. Figley, PhD Editor, *Trauma and Its Wake, The Study and Treatment of Post-traumatic Stress Disorder* Brunfner\Mazel, Publishers, New York, 1985.