

Preparedness for Emergency Response: Guidelines for the Emergency Planning Process

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Especially since the terrorist attacks of 11 September 2001, governments worldwide have invested considerable resources in the writing of terrorism emergency response plans. Particularly in the United States, the federal government has created new homeland security organisations and urged state and local governments to draw up plans. This emphasis on the written plan tends to draw attention away from the process of planning itself and the original objective of achieving community emergency preparedness. This paper reviews the concepts of community preparedness and emergency planning, and their relationships with training, exercises and the written plan. A series of 10 planning process guidelines are presented that draw upon the preparedness literature for natural and technological disasters, and can be applied to any environmental threat.

Keywords: disaster planning, emergency response, terrorism, emergency preparedness.

Since the 11 September attacks on the World Trade Center and Pentagon in the United States, there has been much concern worldwide with levels of community emergency preparedness. Indeed, in the US, UK and Europe there has been much emphasis on — almost a furore for — the rapid development of emergency plans to combat or cope with the consequences of terrorism (Perry and Lindell, 2003). The renewed awareness of terrorist acts as a salient hazard has both brought more actors into the disaster-planning arena and emphasised the need for coordination among their efforts. Emergency managers have been joined by law enforcement, military and policymakers and elected officials in calling for and preparing plans for terrorist incidents (Hoffman, 2001). Much of this work places terrorism in the general context of understanding human behaviour under stress, logically drawing on the literature of natural and technological disasters. As Alexander (2001) has pointed out, terrorism has obvious features that separate it from other types of disasters, but in terms of consequences and planning milestones there are inevitable similarities.

In the US, two problems arise in this context of creating plans for terrorist incidents. The first difficulty is an emphasis on the presence of a plan as a document rather than an emphasis on the planning process — and the positive outcomes it brings — for the threat. The second problem is a general lack of awareness of the literature on planning for natural and technological disasters on the part of elected officials, policy actors and law-enforcement officials who direct much of the terrorism plan construction (Jenkins, 2001; Smithson and Levy, 2000). While European governments have avoided wholesale renovation of their structures for emergency planning and management, the US national government and many state governments have made

drastic changes. Agencies that traditionally addressed natural and technological disasters have been combined with agencies that have traditionally dealt with law enforcement, intelligence, coast guard functions, immigration and border issues among others. Furthermore, the politically appointed administrators of many agencies and their immediate subordinates have come from the general law-enforcement community, sometimes with little experience in broader natural and technological disaster management. The result is the construction of plans (documents) that tend to emphasise a law-enforcement perspective or immerse important lessons from natural and technological planning, sometimes falling prey to myths and mistakes that have long been known in the broader community of disaster managers (US General Accounting Office, 2003).

The purpose of this paper is to clarify the relationships among three critical components of community emergency preparedness — planning, training and written plans — with an emphasis on the role of the planning process. While many of the studies cited here are North American (and presuppose a federal system), international studies are integrated as well. Federal systems are different from the centralised states in Europe and much of the rest of the world. There is value across national systems, however, in that planning guidelines described below do apply broadly to the demands imposed by disaster impacts no matter what national system is in place. It remains, of course, that the political system in which disasters occur will always impose unique challenges for planning, response and accountability (Perry and Hirose, 1991).

Specifically, a series of guidelines for the planning process are discussed here; only one part of which is the generation of written plans. Of course, these ideas are not new, particularly not to experienced disaster researchers or managers, or to those engaged in international disaster response and recovery efforts. The first presentation of these guidelines was made by Dynes, Quarantelli and Kreps (1972) and codified later by Quarantelli (1982), under the rubric of ‘principles of disaster planning’. Subsequently, other researchers (Anderson and Mattingly, 1991; Lindell and Perry, 1992; Boin and Lagadec, 2000; Alexander, 2002, 2003) have expounded upon and extended the discussion. A distinguishing feature of the present discussion is the placement of planning in the context of current concerns regarding terrorism. The infusion of a variety of novice emergency managers — particularly in the US — into the disaster-planning community has created, however, an audience that can benefit from a review of planning guidelines.

This review will largely draw upon work conducted in the context of natural and technological disasters. There may not be a direct translation of results from other types of disasters to terrorist events. Minimally, there is much variation based on the nature and consequences of the agents used by terrorists: weapons of mass destruction using incendiary explosives, and chemical, radiological and biological agents. For example, the different effects of specific threats have been studied and it is known that some agents (radiation for example) generate higher and more acute levels of fear than others (Slovic et al., 1980). Overall, there are many distinct features of disasters generated by natural forces, technology and terrorists. As Alexander (2001) notes so aptly, natural disaster forces are not thinking beings like terrorists. On the other hand, it is recognised that there are similar consequences generated for humans and structures by the three types of disaster. Thus, for many years the same basic planning process has been used for both natural and technological hazards and disasters (Lindell and Perry, 1992; Britton, 2002). Consequently, it is reasonable to expect that the same planning framework forms at least a reasonable starting point for community preparedness for terrorist incidents (National Academy of Sciences, 2002). Of course,

the concept of mitigation for terrorist incidents is entirely different from other disasters, and terrorism involves unique aspects of law-enforcement issues in response plans. However, planning knowledge from the general disaster literature can be used to build a basic structure for terrorism plans by isolating important aspects of process and outcome.

Community emergency preparedness

Emergency preparedness refers to the readiness of a political jurisdiction to react constructively to threats from the environment in a way that minimises the negative consequences of impact for the health and safety of individuals and the integrity and functioning of physical structures and systems. The achievement of emergency preparedness takes place through a process of planning, training and exercising accompanied by the acquisition of equipment and apparatus to support emergency action (Gillespie and Colignon, 1993). The response measures and protocols generated by the planning process and rehearsed via training and exercises are documented in the written plan. In this way, written plans become living documents, to be revised and changed as the threat changes and the system for detecting and responding to the threat changes.

Often, there is a tendency to equate emergency planning with the presence of a written plan and similarly believe that a written plan is evidence of jurisdictional preparedness. In practice, it is important to avoid confusing planning with a written plan; planning is a never-ending jurisdictional process, while the plan itself represents a snapshot of that process at a specific point in time. Similarly, a written plan does not guarantee preparedness; preparedness is dynamic and contingent upon ongoing processes. Thus, possession of a written plan is an important part of, but not a sufficient condition for, community emergency preparedness. Preparedness is a state of readiness to respond to environmental threats. It results from a process in which a community examines its susceptibility to the full range of environmental hazards (vulnerability analysis), identifies human and material resources available to cope with these threats (capability assessment), and defines the organisational structures by which a coordinated response is to be made (plan development). Because vulnerability, resources and organisational structures change over time and performance skills disappear when not exercised, planning and training must be continual processes in order to establish and maintain emergency preparedness (Daines, 1991; Buckle et al., 2000). It is consequently important to examine carefully the emergency planning process, making explicit its relationship to preparedness and examining both the elements and products of planning. Our focus is upon the planning practices and the level of preparedness that results from these planning practices.

Emergency planning may be conceived and implemented as a process. It is a continuing pattern of analyses, as well as opportunities for the development and maintenance of individual and team performance skills achieved through training, drills and critiques (Kartez and Lindell, 1987; Lindell and Perry, 1992; Peterson and Perry, 1999; Tewdwr-Jones, 2002). This is not to suggest that emergency planning is a linear process or that it is somehow embodied only in formal exchanges, meetings and contacts. Indeed, much of planning is nonlinear. For example, in consulting on one phase of analysis — perhaps delivery of emergency medical care — planners may realise that issues remain unresolved from an earlier phase of planning — perhaps the

need to extricate victims from rubble. As one moves towards addressing issues of response, there is a constant need to 'refer backwards' to matters that may impinge upon the ability to execute the target response. Similarly, informal communications among responders during drills or observations by planners talking with their counterparts in other jurisdictions often generate valuable innovations (Peterson and Perry, 1999).

Emergency planning as an approach to dealing with environmental hazards is driven by two objectives: hazard assessment and risk reduction. Hazard assessment involves not only identifying threats that have previously affected the community, but also employing technology that leads to prompt identification of new or potential threats. For many natural and technological hazards, these may take the form of a combination of knowledge of the local environment and more costly reviews presented in national government technical reports or reporting systems. Once the hazards are identified, the planning process should produce an assessment of their risks. Identifying and monitoring most risks involves inter-governmental partnerships among local jurisdictions and higher governmental authorities with greater available resources. The most costly and complex identification and detection technology is usually based within national governments, who operate formal programmes for sharing information with intermediate and local jurisdictions. As one moves from local to national government levels, the technology and expert resources increase. As one moves down the intergovernmental structure, knowledge of local circumstances and capabilities increase. The assessment of risks includes a technical investigation of the magnitude of the undesirable consequences to the community's safety, health, property and social and economic activity and can, in some instances provide information about the probability of occurrence.

Risk reduction involves an examination of the actions necessary to decrease the detected or projected levels of danger and to identify the resources required for implementing those actions. Since the available resources are rarely equal to the threat, this process implicitly defines the remaining level of danger considered to be acceptable (Dynes, 1993). Thus, the decision to manage a particular hazard and the level of protection to be sought draws upon technology but has a political (community resource distribution) element. Hazard identification and assessment can be thought of as procedures through which environmental threats to the community can be measured, monitored and evaluated, while risk reduction may be viewed as the development and implementation of activities aimed at mitigation, preparedness, response and recovery (Mileti, 1999).

Even within the context of achieving protective objectives, the practice of emergency planning varies considerably among communities and nations. Whether or not such variation is desirable, it is a fact of the planning environment. Like any other human activity, planning depends on the resources, skills and motivation of those that engage in that activity. The extent to which knowledge, resources and personnel are available may differ significantly from one jurisdiction to the next. In large part, it is the efforts at national levels that disseminate information and expertise that are designed to 'level the playing field' across local governments to obtain a more even level of protection.

As a process, planning may be quite formal — with a specific assignment of responsibility to an office which has an identifiable budget. But planning can also be largely informal, with responsibility poorly defined and the limited budget available dispersed among many agencies within a jurisdiction (Dynes, 1998). Typically, the availability of jurisdiction resources drives threat awareness and the nature of planning

processes. Similarly, the products associated with planning may be mostly written or mostly unwritten. To a certain extent, the nature of the emergency planning process will correlate with the size of the community in which it takes place. Larger communities — characterised by an elaborate structure of governmental offices, many resources and personnel, and perhaps higher levels of staff turnover — tend to evolve formalised processes and rely more heavily upon written documentation and agreements. In smaller communities the planning process may generate few written products and be largely reliant upon informal, personal relationships for risk identification, assessment and reduction. Formalisation of the planning process is also likely to vary with the frequency of hazard impact. In communities subject to frequent threats, response to the hazard may be a practised skill rather than a hypothetical action. In a frequently flooded community, the local fire department may evacuate residents of the low-lying areas (in the usual manner, to the usual safe location) when the water reaches a certain street. There is considerable value to formalisation, however, even for the smallest jurisdiction. With formalisation comes stabilisation of response and increased likelihood of back-up safety systems, decreased likelihood of system breakdowns due to forgetting and increased probability that a successful response will be mounted to a given threat. Furthermore, as citizens hold jurisdictions responsible in court for inadequate emergency response, written procedures form a baseline of information regarding exactly what a jurisdiction did do to abate a danger (Lindell and Perry, 1992).

Guidelines for emergency planning

While the degree of formality of the planning process does not necessarily provide an adequate indication of the level of emergency preparedness, it is possible to identify other aspects of planning that do appear to be empirically correlated with high levels of community preparedness. There are many criteria which one could use to identify guidelines, and consequently many possible guidelines. Quarantelli (1982) used 10 such principles, as did Alexander (2003) and Lindell and Perry (1992), while Rockett (1994) proposed 19. To some extent the choice of number is idiosyncratic to the researcher or practitioner, or depends upon the depth of coverage desired and permitted. The goal here is to focus on broader process-oriented guidelines about which there is much historical and current consensus among both researchers and practitioners. Thus, following Quarantelli's (1982) lead and the more recent tradition of research, 10 such practices have been selected here, which are based in the research literature and represent recommended orientations to the emergency planning process (Drabek, 1986; Emergency Management Australia, 1998; New Zealand Government, 2002; Tewdwr-Jones, 2002; Lindell and Perry, 2003). While making no claim to originality, but standing on the shoulders of those who came before, the belief is that the guidelines form useful information for the ever-expanding community of those interested in or engaging in disaster planning.

The first guideline for preparedness planning is that it should be based upon accurate knowledge of the threat and of likely human responses. Accurate knowledge of the threat comes from thorough hazard assessment and vulnerability analysis. Certainly the absence of an appropriate technology may render some threats not predictable (earthquakes, for example) or an ineffective technology may make mistakes of prediction and detection, or — as with some chemical threats to health — science

may not yet have discovered their toxicity. These simply represent cases where there is either defective knowledge or no knowledge. The guideline is an exhortation to find the best available knowledge, knowing that the best may not be optimal.

Once the hazards to the jurisdiction have been identified through vulnerability analysis, planners and public officials can more readily recognise the limits of their expertise. When accurate knowledge about the behaviour of a geophysical (earthquake and volcano), meteorological (tornado and hurricane) or technological (hazardous materials) threat is lacking, the need for contacting an expert to obtain it is usually readily recognised (Alexander, 1993: 613–15). Similarly, there is little difficulty in convincing planners and jurisdictional authorities that highly specialised experts need to be consulted in preparing for terrorist threats involving weapons of mass destruction (WMD).

Unfortunately, the same cannot usually be said about accurate knowledge regarding likely human behaviour without regard to the threat agent being addressed (Dynes, 1994; Tierney et al., 2001). As a familiar saying goes, the problem is not so much that people do not know what is true, but that what they do 'know' is false. Long ago Quarantelli and Dynes (1972) and Wenger and James (1994) succinctly described a number of common myths regarding citizen disaster response behaviours that seem to persist in spite of much research that shows otherwise. Contrary to the beliefs of the general public, and, more distressingly, public officials and even residents of communities that have previously experienced disasters, disaster victims typically act rationally, given the limited information they have about the situation. They do not flee in panic, wander aimlessly in shock or comply docilely with the recommendations of authorities (Perry and Lindell, 2003). Instead, victims are likely to make their own decisions about whether and when to evacuate. Following impact, they are the first to search for survivors, care for the injured and to assist others in protecting property from further damage. When they do seek assistance, victims are more likely to contact informal sources such as friends, relatives and local groups rather than governmental agencies or even such quasi-official sources as the Red Cross. Moreover, looting in evacuated areas is extremely rare, while crime rates tend to decline at least temporarily following disaster impact. Finally, the general public believes that concerned citizens can best help the victims by sending money and supplies or going into the impact area to provide assistance (Wenger and James, 1994); witness for example the large volume of monetary donations to a 'victim's and families fund' following the 11 September attacks on the World Trade Center.

These disaster myths are not inconsequential: they hamper the effectiveness of emergency planning by misdirecting the allocation of resources and the dissemination of information. For example, concerns about looting lead to an overemphasis on perimeter security of evacuated areas, while expectations of panic are often given as justification for giving the public incomplete information about an environmental threat or withholding information altogether. This response to the myth of panic is particularly troubling since it has been shown repeatedly that people are more reluctant to comply with suggested emergency measures when they are provided with vague or incomplete warning messages (Perry et al., 1981). Ironically, the misconception that accurate information will cause panic can lead officials to take actions that frustrate their own attempts to protect the public. Therefore, the planning process must be firmly grounded not only on the physical or biological science literature on the effects of the hazard agent on human safety, health and property, but also on the behavioural literature describing the response patterns of affected populations and emergency organisations. Local emergency planners should strive to

make their information searches about specific hazards cast a wide net; over federal, state and private resources (Anderson, 1995; Quarantelli, 1998). Furthermore, at this level of planning each hazard agent needs to be approached individually. There is no 'one-size-fits-all' description of agent-generated and response-generated demands for all hazard agents. Similarly, there is no 'model plan' that will serve every community effectively.

A second characteristic of effective planning is that it should encourage appropriate actions by emergency managers. Particularly with regard to disaster operations, much emphasis has been given to the idea that careful planning promotes quicker response. While quick response is important, it is not the only objective of emergency planning. Quarantelli has argued that appropriateness of response is much more crucial than speed:

It is far more important in a disaster to obtain valid information as to what is happening than it is to take immediate action ... planning in fact should help to delay impulsive reactions in preference to appropriate actions necessary in the situation (1977: 106).

Two points are important here. First, threat assessment is critical and must be performed continuously, even during periods of disaster impact. Emergency planning has too often been equated with evacuation planning or some other subset of emergency response functions and focused upon issues too narrow to achieve real hazard management. Emergency plans must address the logistics of threat assessment as well as response. Second, quick reactions based upon incorrect assumptions or incomplete information can lead to inadequate protective measures. For example, after the Tokyo subway attack using the chemical agent sarin (Smithson and Levy, 2000), local governments — aware of the necessity of rapid administration of nerve gas antidotes to insure efficacy — began to emphasise speed of response in potential WMD incidents. In some jurisdictions this well-intended planning mandate leads to the potential deployment of emergency medical personnel — typically lacking special protective garb and breathing equipment — into an extremely hazardous environment which increased the likelihood that they would themselves become victims. While massive federal efforts to appropriately equip and enhance awareness of first responders have reduced the danger, the situation calls into question the utility of simple speed in response (Jackson et al., 2002). In the high-pressure atmosphere that accompanies a community disaster, particularly terrorist attacks, it is undoubtedly difficult for an emergency manager to appear to be 'doing nothing'. As this example and many others show, however, it is important to recognise when the best action to take is to mobilise emergency personnel and actively monitor the situation for further information. Under these circumstances, the discipline created by the planning process may save both lives and property. It is axiomatic to point out that accurate knowledge — both of the hazard and response principles — is required for emergency managers to take appropriate action.

The preceding example also serves to highlight another guideline for effective planning. It is important to acknowledge that all disasters create dynamic changing environments and that it is impossible to cover every contingency that might arise in connection with a future disaster event. Hence, the planning process should emphasise response flexibility so that those involved in operations can adjust to changing disaster demands, both agent-generated and response-generated. The planning process should focus on principles of response rather than trying to elaborate the process to include

many specific details. The incorporation of great detail is problematic in at least four ways. First, the anticipation of all contingencies is simply impossible (Frosdick, 1997), even local conditions change too rapidly to depend completely upon a fault tree or checklist to guide operations. Second, very specific details tend to get out of date very quickly, demanding virtually constant updating of written plans (Dynes et al., 1972; Hoetmer, 2003). The updating process is both time and resource consuming and when done too frequently diverts energy from other activities. Third, very specific plans often contain so many details that each emergency function appears to be of equal importance, causing response priorities to be unclear or confused (Tierney, 1980; Carter, 1991). Finally, as more detail is incorporated into written planning documents, they become larger and more complex. This makes it more difficult to use the plan as a device for training personnel to understand how their role fits into the overall emergency response and consequently makes it more difficult to implement the plan effectively when the need arises.

From this perspective, planners should recognise realities of the setting in which disaster operations take place by focusing on the fundamental principles of response, clearly specifying priorities, and minimising the amount of operational detail that restricts flexibility. The place for operational detail is the standard operating procedures of agencies and organisations that execute emergency response functions, not in the jurisdictional plan. The jurisdictional emergency management system should strive to assure that emergency response personnel are thoughtful professionals trained to evaluate situational contingencies and act in accordance with those assessments. The alternative — attempting to identify all or even most of the situations to which emergency personnel would have to respond — is quite unlikely to be successful. Even were it possible to identify all emergency scenarios, the number of different contingencies would be so large that it would be difficult to locate the right ‘script’, thus leading responders to forgo predetermined assessments in favour of their own evaluations. Finally, heavily elaborated plans run the risk of becoming ‘sacred documents’ that are perhaps more likely to be revered than to be questioned, changed and adapted. Such a state of affairs can ultimately hinder response capability.

A fourth guideline is that emergency planning should address inter-organisational coordination. In the twenty-first century, emergency response is inter-departmental within a jurisdiction and at the same time inter-governmental. Although the need has been present for decades, the recent emphasis upon preparing for terrorist threats — chemical, biological and radiological agents — shows that planning involves emergency managers, law enforcement, hospitals, public health departments, the military and a host of other organisations embodying a wide range of threat-relevant expertise. Furthermore, it has long been known that the success of disaster response operations is substantially affected by the achievement of effective inter-organisational coordination among responding groups (Perry, 1991). Ideally such organisations work in concert to accomplish a variety of disaster-relevant functions: emergency assessment, warning dissemination, population protection and so on. To accomplish the full range of emergency response functions requires that organisations be aware of each other’s missions, structures and styles of operation, the capabilities and limitations of the communication system and the mechanisms for coordinating the allocation of scarce resources to different functional areas of the emergency response. All of this knowledge has its roots in the planning process, is conveyed through training, and is tested in joint exercises (Shelton and Sifers, 1994).

As an illustration of the problems that can arise when individual agencies are unaware of the roles of other organisations, consider the case of a flood-stricken

community (Perry et al, 1981). Citizens who were warned to evacuate, but had no personal transport were advised to congregate at their neighbourhood fire station. The firefighters there were unaware of the emergency plan providing that such people would be taken to a reception centre at a nearby school and, in a misguided humanitarian gesture, began to make arrangements for the evacuees' temporary food and lodging. This needlessly duplicated a response function being performed more efficiently elsewhere, and also diverted fire-service personnel from the specialised duties that they were assigned by the plan.

The emergency planning process is probably the most effective place (and certainly the most desirable) for developing the coordination that response teams will need during an actual emergency. There are two ways in which such issues can be resolved. The first of these is in careful review of the emergency plans of individual agencies, while the second is in repeated drills, exercises and critiques of the plan (Shapiro, 1995; Peterson and Perry, 1999). Much time and frustration can be saved if the planning process is conducted in such a way that assumptions about response performance can be scrutinised even before the plan is tested in a drill or exercise. For example, consider the city in the south-western US that wanted to upgrade its capacity to respond to hazardous materials incidents initiated by airplane crashes (Perry, 2001). The city bordered a large regional airport and, while the police department had plans for responding to airplane crashes and the fire department maintained a hazardous materials response plan, there was minimal integration of the planning efforts of these two agencies. The newly created emergency management office was given the task of developing a comprehensive plan for crashes involving hazardous materials. Fortunately the planning process established by the new emergency manager included a careful review of all resources to be used by each organisation responding to an emergency. It was in reviewing these lists that the emergency manager discovered that the police and fire department radio equipment was such that neither department could pick up a signal each other. Yet, the police were charged with protective response for the public and the firefighters with mitigating the hazard in the same event. Had the emergency manager simply merged the two plans instead of providing a critical review as part of the planning process, this discrepancy would probably not have been discovered until the plan was tested, or worse, until an actual emergency activated the plan. Just such a problem did occur during a fire at the Brown's Ferry Nuclear Power Plant, where it was found that the hoses for the local fire department could not be coupled to the water supply from the plant because the hose fittings were incompatible. Certainly, the operational problem would have been discovered in an exercise, but simple reviews of plans in progress by response organisations eliminates the difficulty early and reinforces the teambuilding atmosphere.

Of course, drills should be viewed as the setting where problems are expected and conflicts can be resolved. Like a test on which all students achieve a perfect score raises the suspicion that it is too easy, a drill or exercise that identifies no problems is probably one with either a trivial scenario or an inadequate evaluation. It is also clear that the repeated experience of dealing with disaster events will inevitably help organisations to devise workable coordination strategies. The notion of repeated disaster impacts with severe negative human or structural consequences does call into question the effectiveness of hazard management. For example, if the same area of the same community floods each year destroying dozens of homes, one wonders if the local hazard zoning system is working properly (May and Deyle, 1998). Furthermore, building inter-organisational relationships primarily by responding to disaster impacts is likely to carry with it an unnecessarily high cost. An effective planning process,

characterised by careful plan reviews and thoughtfully critiqued emergency exercises, provides alternatives to learning from experience (Kartez and Lindell, 1989).

The emergency planning process should also integrate plans for each individual community hazard managed into a comprehensive approach for multi-hazard management. During the cold war, many Western democracies used a 'dual use' planning policy that identified and funded emergency functions that were useful in some natural or technological disaster and a nuclear attack. Since the cold war ended, emergency managers have defined the disaster planning process in terms of comprehensive or integrated emergency management: preparedness to address all phases of all disaster agents that may threaten a community. Both of these approaches depend upon the assumption (often demonstrated in practice) that different disaster agents may create similar agent-generated and response-generated demands. At this intersection of similarity, the same emergency response functions can be effectively used to address different hazard agents (Quarantelli, 1992). Thus, the movement of citizens away from the impact area — evacuation — is a useful response to hurricanes, floods, chemical releases, nuclear power plant accidents, terrorist attacks and volcanic eruptions. Commonality of emergency response functions provides multiple use opportunities for personnel, procedures, facilities and equipment. The concept of generic functions is often cited as one of the strongest arguments for comprehensive emergency management, but requires careful attention as part of the planning process before management benefits may be realised.

A sixth disaster planning guideline rests on the idea that plans should have a training component. The planning process has many audiences, in part because many different individuals and organisations are involved in implementing emergency plans. Audiences even extend beyond the types of organisations that directly respond; for example, government bodies that fund emergency management programs and evaluate plans and incident response are a critical audience. Thus, effective planning requires explaining the provisions of the plan to the administrators and personnel of those departments that will be involved in any phase of the emergency response. Also, elected officials and citizens need to be informed about community disaster plans, preparedness and response operations. The public-at-risk must also be involved in the planning process, especially if they are expected to undertake personal protections in an emergency. Minimally, all citizens and officials should be aware that planning for community threats is under way and what is expected of them under the plans. Moreover, they need to know what is likely to happen in a disaster, and what emergency organisations can and cannot do for them.

Consequently, the training component of a plan has at least two tiers. One is an information function primarily aimed at elected officials, public administrators who do not have a specific emergency role and citizens. Traditionally, sharing plan information with these audiences is called risk communication and is oriented to educational exchanges. In some very special cases, communications to the public-at-risk may include specific training and equipment. In some cases, residents close to nuclear power plants may be given potassium-iodide tablets and instructed on their use. Similarly, residents near the US army centre in Alabama charged with incinerating chemical warfare agents have been given gas masks and other special training by the county emergency management agency. When plan information is shared with personnel of emergency response organisations, it is usually more formal and comes under the rubric of training. Such training is distinguished by the fact that it tends to be administered by technical specialists and focused on specific protocols and processes. For example, many terrorist response plans assume that fire and police department

dispatchers will screen all calls for assistance for signs that the emergency being reported is really a chemical, biological or radiological attack. Even if the elements of call screening protocols are explicitly developed in the plan, initial training (and refresher training) by specialists will be needed to ensure that dispatchers can effectively use the protocol. Training is consequently an integral part of the disaster planning process, and when carefully attended to, is likely to yield high dividends in terms of the effectiveness of emergency response. As an added benefit, the training process can also become an important source of feedback regarding potential problems with the plan.

Another guideline for an effective planning process is that it should provide for testing proposed response operations. Emergency drills and exercises provide a setting in which operational details may be critically examined (Ford and Schmidt, 2000; Simpson, 2001; Alexander, 2003). Testing of plans also serve other important functions. They bring responding organisations into contact and allow individuals to develop personal relationships with one another. Furthermore, drills constitute a simultaneous and comprehensive test of emergency plans, staffing levels, personnel training, procedures, facilities, equipment and materials. In the case of planning for terrorist attacks, an inter-organisational testing process is complicated because it involves types of organisations that may not normally deal with one another. These can be organisations that cross public and private sectors, cross emergency disciplines, and different types and levels of government. Finally, conducting drills serves as one form of publicity for the larger emergency planning and management process. Publicising drills informs both the public and community officials that planning for disasters is under way and that preparedness is being enhanced.

One of the most important attributes of effective emergency planning is that it is a continuing process. No effective plan process is static. Change should be incorporated into every aspect of the emergency management system. In general, the plan should change to accommodate changes in the threat environment and with the introduction of new or improved equipment (including personal protective equipment, testing equipment and communications) for responding to incidents. It is expected that after every incident and every training cycle and every drill the plan will improve. For all response agencies, as their experiences, capabilities and equipment change, these changes will have an impact on the larger system. Indeed, an important benefit of the planning process is the mutual recognition and acknowledgement that there is a local response system and that those involved are mutually dependent (Tierney et al., 2001).

Clearly, if planning is conceived of as an approach to dealing with environmental emergencies, there is never a time when planning is 'completed'. Hazard vulnerability, organisational staffing and structure and emergency facilities and equipment have the potential for changing over time and the emergency planning process is the means of detecting, monitoring and responding to these changes. A piece of written documentation, or a particular plan, may be generated through the planning process, but as conditions change the written documentation must also change.

Unfortunately, this point is frequently not recognised. Wenger and his colleagues (1980: 134) have found that 'there is a tendency on the part of officials to see disaster planning as a product, not a process'. Such research documents the problem of equating tangible products with the activities that produced them. Of course, planning does require written documentation: definition of the nature and probability of threats, procedural checklists, lists of resources and records of agreements. But effective planning is also made up of elements that are not realised in

hardware and are difficult to document on paper. These include the development of managers' knowledge of the resources of governmental and private organisations, the sharpening of their conceptual skills in anticipating emergency demands and balancing these against available resources, and the establishment of linkages across organisational boundaries between emergency planners and operations personnel. To assume that tangible hardware and documentation provide a sufficient representation of the emergency planning process is simply incorrect. Furthermore, by treating written plans as a final product, one risks creating the illusion of being prepared for an emergency when such is not the case (Quarantelli, 1977). As time passes, the emergency plan sitting in a red three-ring binder on the bookshelf looks just as thick and impressive as it did the day that it was published. Unfortunately, many changes are likely to have taken place in the meantime. New hazardous facilities may have been built, and others decommissioned. Changes in zoning ordinances may have altered population densities in different neighbourhoods. Reorganisation may have been taken place within different agencies responsible for emergency response. In short, the potential for changes in the nature of the hazard, the nature of the population at risk, and the staffing, organisation and resources of emergency response organisations dictates that emergency plans and procedures be reviewed periodically, preferably annually.

Still another guideline for emergency planning is that it is almost always conducted in the face of conflict and resistance (Quarantelli, 1982). Among the truisms about emergency planning is that citizens do not like to think about the negative consequences of potential disasters — a state of mind that tends to inhibit a spirit of preparedness. Regrettably, this attitude generalises as well to public servants and to elected officials. A common objection to planning raised by such officials is that it consumes resources, and resources spent on planning cannot be spent on what — at the moment — may seem like much more pressing community issues. Administratively and legislatively mandated planning requirements alone are insufficient to overcome this formidable resistance and the initiation of planning activities requires strong advocacy. Nor does the acceptance of the need and allocation of resources to emergency planning ensure the elimination of conflict. Emergency planning involves the allocation of power and resources (especially personnel and budget) and every department within the jurisdiction wants its 'proper role' recognised and a budget allocation commensurate with that role. No level of government is immune to such conflict.

Finally, a tenth guideline for emergency planning is that the emergency plan should recognise that planning and management are different functions and that the true test of a plan rests with its implementation during an emergency (Quarantelli, 1985). Planning is a part of preparedness — it requires identifying the hazards to which the community is vulnerable, the nature of the impacts that could occur, and the geographical areas at risk. Planning also requires identifying the demands that a disaster would impose upon emergency response organisations and the resources (personnel, facilities, equipment and materials) that are needed by those organisations in order to meet the emergency demands. Management of the emergency response, on the other hand, involves performance — meeting the emergency demands by implementing the assessment, corrective, protective and coordinating actions identified in the planning stage. One can draw the analogy that planning lays out the design for a building while management of the emergency response involves sawing boards and pounding nails. Confusing the two functions leads to the poor performance of both.

Conclusions

Continuing terrorist attacks worldwide are likely to sustain attention to emergency planning, particularly in Western democracies. In the US at least, no period of recent memory has seen the investments of government money and resources in emergency planning that have been infused since 11 September 2001. To the extent that these resources actually reach emergency managers and first responders there is great potential for growth in the field and in levels of protection. This is a tremendous opportunity for the field and practice of emergency planning because the same resources that fuel terrorism planning can also support functions needed in natural and technological disasters, thereby benefiting preparedness broadly. There is concern, however, that the introduction of terrorist attacks into the pantheon of natural and technical disasters for which jurisdictions must prepare poses new challenges for the processes of planning and management (Rudman et al., 2003). To the extent that one focuses upon generic functions in disaster management — evacuation, communications, emergency medical care, heavy rescue and morgue care — these also apply to conditions created in terrorist incidents, the application appears straightforward. Great complications portend, however, if the lessons from natural and technological threats go unheeded or if decision-makers are uninformed regarding those lessons. Guidelines for planning processes are among the most basic of such lessons, forming the intellectual and practical structure that enables preparedness. It is true that disasters, whether perpetrated by natural and technological forces or by terrorists, do not wait for planning processes to become organised to proceed. It is also true that a written emergency plan does not guarantee preparedness and that plans created with an abbreviated or absent planning process may lack practical utility. Through the ongoing planning process, reflecting sound principles, one can achieve a reasonable translation of vulnerability into a workable emergency response. However, the ignorance of appropriate planning principles is just as dangerous to effective outcomes as inaccurate knowledge of the threat, lack of necessary protective equipment or failure of the jurisdiction to allocate resources to emergency preparedness and response (Perry, 2003).

References

- Alexander, D.E. (1994) *Natural Disasters*. Chapman and Hall, New York.
- (2001) Nature's Impartiality, Man's Inhumanity. *Disasters* 26 (1): 1–9.
- (2002) *Principles of Emergency Planning and Management*. Oxford University Press, New York.
- (2003) Towards the Development of Standards in Emergency Management Training and Education. *Disaster Prevention and Management* 12 (2): 113–23.
- Anderson, P. (1995) The Biggest Mutual Aid System on Earth: The Internet in Emergency Management. *National Coordinating Council on Emergency Management Bulletin* 1: 7–9.
- Anderson, W. and S. Mattingly (1991) Future Directions. In T. Drabek and G. Hoetmer (eds.) *Emergency Management*. International City/County Management Association, Washington.
- Boin, R. and P. Lagadec (2000) Preparing for the Future. *Journal of Contingencies and Crisis Management* 8: 185–91.
- Britton, N. (2002) A New Emergency Management for a New Millennium? *Australian Journal of Emergency Management* 16 (4): 44–54.
- Buckle, P., G. Mars and S. Smale (2000) New Approaches to Assessing Vulnerability and Resilience. *Australian Journal of Emergency Management* 15: 8–14.

- Carter, N. (1991) *Disaster Management: A Disaster Manager's Handbook*. Asian Development Bank Publications, Manila.
- Daines, G.E. (1991) Planning, Training and Exercising. In T. Drabek and G. Hoetmer (eds.) *Emergency Management*. International City/County Management Association, Washington.
- Drabek, T. (1986) *Human System Response to Disaster*. Springer Verlag, New York.
- Dynes, R. (1993) Disaster Reduction. *Sociological Spectrum* 6: 24–8.
- (1994) Community Emergency Planning. *International Journal of Mass Emergencies and Disasters* 12: 141–58.
- (1998) Coming to Terms with Community Disaster. In E.L. Quarantelli (ed.) *That Is a Disaster?* Routledge, London.
- , E.L. Quarantelli and G. Kreps (1972) A Perspective on Disaster Planning. Ohio State University Disaster Research Center, Columbus.
- Emergency Management Australia (1998) Australian Emergency Manuals, Part 1: Planning Fundamentals. Commonwealth of Australia, Canberra.
- Ford, J. and A. Schmidt (2000) Emergency Preparedness Training. *Journal of Hazardous Materials* 75: 195–215.
- Frosdick, S. (1997) The Techniques of Risk Analysis are Insufficient in Themselves. *Disaster Prevention and Management* 6(3): 165–77.
- Gillespie, D. and R. Colignon (1993) Structural Change in Disaster Preparedness Networks. *International Journal of Mass Emergencies and Disasters* 11(2): 143–62.
- Hoetmer, G. (2003) Characteristics of Effective Emergency Management Organisational Structures. Public Entity Risk Institute, Fairfax.
- Jackson, B., D. Peterson, J. Bartis, T. LaTourrette, I. Brahmakulam, A. Houser and J. Sollinger (2002) Protecting Emergency Responders: Lessons Learned from Terrorist Attacks. Rand Corporation Science and Technology Policy Institute, Santa Monica.
- Jenkins, B. (2001) 30 Years and Counting. *Rand Review* (Fall): 1–3.
- Kartez, J. and M.K. Lindell (1987) Planning for Uncertainty. *American Planning Association Journal* 53: 487–98.
- and M.K. Lindell (1989) Adaptive Planning for Community Disaster Response. In R. Sylves and W. Waugh (eds.) *Cities and Disaster*. Charles C. Thomas, Springfield.
- Lindell, M.K. and R.W. Perry (1992) *Behavioral Foundations of Community Emergency Planning*. Hemisphere Publishing, Washington.
- and R.W. Perry (2003) *Environmental Risk Communication in Multicultural Communities*. Sage Publications, Thousand Oaks, California.
- May, P. and R. Deyle (1998) Governing Land Use in Hazardous Areas with a Patchwork System. In R. Burby (ed.) *Cooperating with Nature*. Joseph Henry Press, Washington.
- Mileti, D. (1999) *Disasters by Design*. Joseph Henry Press, Washington.
- National Academy of Sciences (2002) *Countering Terrorism: Lessons Learned from Natural and Technological Disasters*. The National Academies Press, Washington.
- New Zealand Government (2002) *Civil Defence Emergency Management*. Government of New Zealand, Wellington.
- Perry, R.W. (1991) Managing Disaster Response Operations. In T. Drabek and G. Hoetmer (eds.) *Emergency Management*. International City/County Management Association, Washington.
- (2001) Communications Interoperability in Fire Department and Police Department Operations. Arizona State University School of Public Affairs, Tempe.
- (2003) Municipal Terrorism Management in the United States. *Disaster Prevention and Management* 12(3): 190–202.
- and H. Hirose (1991) Volcano Management in the United States and Japan. JAI Publishing, Greenwich.
- and M.K. Lindell (forthcoming) Understanding Human Response to Disasters with Implications for Terrorism. *Journal of Contingencies and Crisis Management* 11.
- , M.K. Lindell and M. Greene (1981) *Evacuation Planning in Emergency Management*. Heath-Lexington Books, Lexington.
- Peterson, D. and R.W. Perry (1999) The Impacts of Disaster Exercises upon Participants. *International Journal of Disaster Prevention and Management* 8: 241–54.

- Quarantelli, E.L. (1977) Social Aspects of Disasters and Their Relevance to Pre-disaster Planning. *Disasters* 1(1): 98–107.
- (1982) Ten Research-derived Principles of Disaster Planning. *Disaster Management* 2: 23–5.
- (1985) Emergent Citizens Groups in Disaster Preparedness and Recovery Activities. University of Delaware Disaster Research Center, Newark.
- (1992) The Case for a Generic rather than Agent Specific Approach to Disasters. *Disaster Management* 2: 191–6.
- (1998) The Computer Based Information/Communications Revolution: A Dozen Problematical Issues and Questions They Raise for Disaster Planning and Management. University of Delaware Disaster Research Center, Newark.
- and R. Dynes (1972) When Disaster Strikes. *Psychology Today* 5: 67–70.
- Rockett, J.D. (1994) A Constructive Critique of United Kingdom Emergency Planning. *Disaster Prevention and Management* 3(1): 47–60.
- Rudman, W., R. Clarke and J. Metz (2003) *Emergency Responders: Drastically Underfunded, Dangerously Unprepared*. Council on Foreign Relations, Washington.
- Shapiro, L.T. (1995) Training Effectiveness Handbook. McGraw-Hill, New York.
- Shelton, J. and S. Sifers (1994) Standardizing Training Assessment. *Military Review* 74(10): 5–13.
- Simpson, D.M. (2001) Earthquake Drills and Simulations in Community-based Training and Preparedness Programmes. *Disasters* 26(1): 55–69.
- Smithson, A.E. and Levy, L. (2000) *Ataxia: The Chemical and Biological Terrorism Threat and The US Response*. Henry L. Stimson Center, Washington.
- Tewdwr-Jones, Mark (2002) *The Planning Polity: Planning, Government and the Policy Process*. Routledge, London.
- Tierney, K., M.K.Lindell and R.W. Perry (2001) *Facing the Unexpected: Disaster Preparedness and Response in the United States*. Joseph Henry Press, Washington.
- US General Accounting Office (2003) *Major Management Challenges and Program Risks: Department of Homeland Security*. Government Printing Office, Washington.
- Wenger, D.E., C. Faupel and T. James (1980) Disaster Beliefs and Emergency Planning. University of Delaware Disaster Research Center, Newark.
- and T. James (1994) The Convergence of Volunteers in a Consensus Crisis. In R. Dynes and K. Tierney (eds.) *Disasters, Collective Behavior and Social Organisation*. University of Delaware Press, Newark.

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