

Looking for Answers: Suggestions for Improving How We Evaluate Crisis Management

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Evaluating crisis management is an important yet apparently poorly developed aspect of crisis management. Evaluation of training exercises and of actual crisis management is fundamental for the improvement of crisis management, yet most theorists and practitioners pay passing reference to the process (eg. Albrecht, 1996; Barton, 1993). Reasons for this poor discussion may reside in the fact that we are still developing principles of crisis management. However, issues of due diligence (Albrecht, 1996; Schreider, 1996) and organizational liability (Allinson, 1993; Cohen, 1991; Schreider, 1996) indicate that crisis managers, crisis management experts, coroners, official investigators and judges need to consider how crisis management can be appropriately evaluated. Research indicates that evaluations are distorted by biases (Fischhoff, 1975; Hogarth, 1981), lack of organizational openness (Allinson, 1993), and a need to find scapegoats (Allinson, 1993) or establish blame (Drabek & Quarentelli, 1967). This paper outlines a number of the aspects that investigators and evaluators need to consider when evaluating what was done in managing a crisis.

Evaluation of an actual crisis situation, a simulated crisis or training exercise is probably the most important activity that can be undertaken to improve management of crisis situations and to reduce losses in human lives and resources. This activity, however, is poorly conducted. Existing literature appears unhelpful, with few attempts to establish principles of evaluation beyond summary checklists (Albrecht, 1996; Barton, 1993).

At least four reasons may be given in explanation of this status given evaluation of crisis situations and crisis management. The first reason is that we are still learning to manage crisis situations themselves. Rather like the experiences of the early days of aviation where aircraft crashes were generally regarded as a fact of life because the aircraft were "heavier than air", crisis management is still evolving principles for effective management.

The second reason for the lack of study into techniques of evaluation may be that the objectives of what is being evaluated are blurred. Evaluation of a simulated or real crisis actually consists of four component evaluations: (1) the crisis environment, (2) the crisis incident, (3) the pre-impact crisis management, and (4) the crisis impact management (see Figure 1). The crisis incident covers the precipitating event -- the earthquake, storm, explosion, or "thing gone wrong" that triggers the crisis situation. The crisis environment includes the physical space and any structures or processes involved in (or contributing to) the crisis incident. Pre-impact crisis management covers the efforts to avert or resolve the crisis once that crisis is identified and before the crisis produces impacts such as the threatened loss of life and/or resources. In many crisis situations this component has a short duration. Crisis impact management covers the efforts to alleviate any consequences of the crisis incident.

A brief example may illustrate how these four component evaluations separate. In 1988, the left engine of British Midland Boeing 737-400 Flight BD92 caught fire when the aircraft was flying at around 29,000 feet (crisis incident) en route from London to Belfast. The aircraft was diverted to East Midlands airport, an engine was shut down, and the aircraft failed to reach the airport -- crashing on an embankment on the M1 motorway (pre-impact management). The crisis involved a Boeing 737-400, the British Midlands aviation company, the air crew, the passengers, and air traffic control (the crisis environment). The aircraft crash had survivors who helped themselves, passing motorists or bystanders who gave assistance, professional response agencies taking over from the first-arriver bystanders to make the crash site safe and evacuate the injured and dead (post-impact management). Each of these components is examined for clues to what happened, cause-and-consequence and action-and-consequence links, and contribution to the outcome for each component.

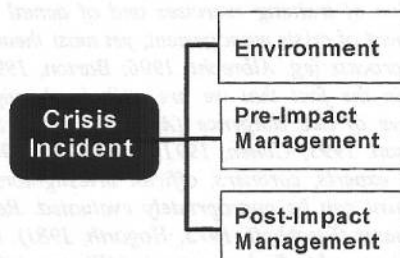


Figure 1. The Four Evaluation Components

The third reason for insufficient attention being paid to evaluating crisis management emerges from the use of this search for establishing contributory error. Allinson (1993) notes that the search for a scapegoat to blame for the crisis, particularly in non-natural disaster crisis situations, often means that other factors that may have produced the crisis may be left unsought when a scapegoat is successfully determined. He finds that "whenever a scapegoat is searched for or cited as the cause of any catastrophe, one may be duly suspicious whether the true culprit or culprits have been found" (p. 11).

A fourth reason for lack of refinement upon evaluation approaches may be traced to the secretiveness of organizational members about their actions, particularly when members feel threatened by criticism or vulnerable to blame assignment. Such reticence and lack of studied openness also is found in many multi-agency post-exercise debriefings. Part of the explanation for this reticence is the growing perception by organizations involved in crisis situations that admission of error or being blamed may lead to criminal charges such as corporate manslaughter or costly litigation. Increasing accent on issues of due diligence (Albrecht, 1996; Schreider, 1996), organizational liability (Allinson, 1993; Cohen, 1991; Schreider, 1996) and duty of carer indicate an equally pressing need to understand concerns and issues involved in assessing crisis management.

Foundation Issues and Concerns

Three basic features can shape any evaluation of management in a crisis situation. These three features can be summarised into:

- The Mission -- Finding Out What Happened is Not the same as Judging
- The Situation -- The climate of a Crisis cannot be recreated in an Inquiry Room
- The Evidence -- Biases in Memory and Time Distortion can colour evidential recall.

In gaining some understanding of the concerns raised in these basic features we can improve on how we evaluate crisis management.

The Mission

Whenever we conduct an evaluation we need a clear understanding of the mission proposed for that evaluation. Two types of evaluation exist: (1) the search for correction in terms of reducing the incidence of crises or of impacts of those crises and (2) the search for assignment of guilt (an extreme case of which is scapegoating) and criminal proceedings by which we make judgment upon those "guilty" people.

By using the four components of crisis evaluation, the purposes of evaluation can be separated into four categories, namely:

1. Improve Crisis Management (both pre- and post-impact types),
2. Improve Planning and Operations,
3. Improve the Product or Environment, and,
4. Apportion Blame and Accountability.

Note that the search for improvements involves examining the crisis incident, looking at the processes and structures involved in the incident, looking at how the pre-impact management of the crisis was conducted, and looking at how post-impact aspects were handled.

Given that both types of evaluation commence along the same or parallel path of seeking to identify the cause of the crisis and how the response to the crisis was handled, it is none too surprising that the missions of cause-and-consequence and guilt blur together. Drabek & Quarentelli (1967) find that assignation of blame may help foster an illusion that corrective action is taking place. At least two outcomes arise from a perception that a crisis evaluation includes a hunt for wrong-doers to be made scapegoats. First, people who feel guilty (or know they are guilty) of error are likely to avoid implicating themselves and edit the information they provide or distort such information to protect themselves. Secondly, staff and management of organizations begin to protect the image of their organizations by omitting information that is prejudicial or perceived as potentially damaging to the organization's image.

Most organizations need to make clear that guilt and judgements made about guilt will be done by some other group of people and some other process and not by the evaluation process set up to improve crisis management. By clearly communicating and continually demonstrating the non-judgemental process involved in a search for improvement, people *may* be encouraged to give fuller information about what happened and what was done. Should the losses and costs be serious or suggest illegal activity, investigations seeking the guilty are likely to be undertaken by a law enforcement agency and the arraignment process be done through courts of justice. Even in these circumstances, the unique nature and effects of a crisis situation need to be understood in assessing degree of guilt or culpability.

The Situation

Having established the mission of the evaluation, we need to realise the differences inherent in managing a crisis and in conducting a post-crisis evaluation. Crisis management usually involves having to deal with a crisis or crisis impact in conditions of chaos, missing information, multiple demands on attention, threats of damage or losses, and apparent or real

limitations on the time available in which to make the correct choices and do the correct response actions. These pressures may be surrounded by distracting noise that not only includes sound, but also the activities of others, smells, movement, and flashing lights.

In contrast, evaluation of crisis management is often undertaken over much longer periods of time, in less noisy circumstances, and with far fewer mental and external distractions involved. As experience increases, even those who are involved in evaluating specific crisis incidents may forget the difference between the environment of the crisis and the environment in which investigations and formal inquiries are conducted.

While the environment of a crisis is unlikely to be recreated, steps can be undertaken to provide some insight into such environments by:

1. using existing audio-visual technology to record crisis management as that management is happening,
2. using existing audio-visual technology to record the post-crisis environment,
3. getting evaluators to the crisis situation as soon as possible after the crisis is identified,
4. having evaluators examine the site, and,
5. transporting those hearing and assessing the evaluation findings to the site so they can have some sensory impressions to fix the information they are gaining.

Of course, undertaking many of these actions entails threats -- from health and safety issues, through issues of confidentiality, to issues arising from the compresence response of managers and staff when they are being recorded while managing a crisis. A compresence effect arises when people are conscious of being observed, and this effect may have negative consequences in performance should the awareness of being observed cause distractions and inhibitions.

Some law enforcement agencies already provide dedicated audio-visual units to record major incidents that range from accidents to riots. Most of these agencies seek some means of recording events in a major disaster. Likewise many fire-fighting services try to get experienced evaluators to the scene of a fire, although these people tend to fully focus on establishing the source and cause of a fire and not on management of the fire situation.

The Evidence

Another major constraint resides with the weight evaluators assign to the evidence gained from witnesses. Research into eyewitness reliability and into the effects of biases upon memory and judgment tends to suggest that we make unreliable witnesses and have memories that are subject to the effects of a number of biases, particularly from hindsight judgements. Those involved in many crisis situations are also likely to experience time distortion.

Biases. A number of biases on human memory and judgement have been identified. These include primacy effects, recency, and hindsight (Hogarth, 1981). While all biases may influence memory and judgement, hindsight may influence the evidence of witnesses *and* the judgements of those evaluating the crisis incident and crisis management.

Hindsight biases. Participants (and audiences) involved in post-crisis inquiries may often bring hindsight biases into their assessment of what happened. Given the historic information on an event, people tend to revise their beliefs about the event (Fischhoff, 1975). People become "wise" after an event, and the bias of hindsight may make them fail to appreciate the information available at particular times *during* a crisis situation. Hindsight biases thus arise when information about the cause-and-consequence chain of a situation is used to evaluate the information, choices, or actions made at some earlier point in that chain.

Most western societies collectively invoke hindsight judgements about past scientific and industrial efforts. For example, many people tend to condemn early users of nuclear energy (particularly in forms of bombs for warfare) *given the present state of awareness and knowledge about the consequential effects of radiation*. Conveniently, we forget that until bombs were used and nuclear power accidents happened, the reality of exposure and the lengths of time involved in decontamination (via losing half-lives of radio-active material) was not made manifest.

Hindsight effects can be seen in many critiques of contemporary crises. In the Challenger and Flight 103 disasters, for example, trails of warnings and danger signals were present, but *only when the big picture of events up to, and past, the critical incident is consulted after the critical incident has happened*. Anger over the trail of memoranda warning about potential failure of the O-Rings on the engines of Challenger seems justified. Indeed, concerns over information sifting as decisional information was passed up the management chain were associated with the disaster of the launch of the Challenger. Such actions get lost in the system, however, and often emerge as part of either guilty confessions or position protection *only after a disaster happens*. Allison (1993) argues that such lack of open disclosure is a root cause of people-caused problems. This argument, however, does not really take into account the current realities of organisational psychology and community cultures that include the fact that people do not like to hear bad news and personal status and even employment may be endangered should a contrary stance be made too long or too public.

Likewise, prior to the terrorist bombing of Pan American Flight 103, warnings were made about a pending terrorist attack on an aircraft from the USA. Can one really sift real warnings from false warnings? In the United States alone over 1500 terrorist threats were made in 1988. We also need to bear in mind the problem of reluctance to accept non-normal signals. How much validity can we give a signal that *something may happen* when many such signals are found to be false? Had Pan Am cancelled all flights because of a *potential* threat, many of the same people making the hindsight judgement that Pan Am should not have flown aircraft may well have called this to be an over-reaction as no such bombing would have happened. Note that this is yet again an example of hindsight judgement.

Bignell, Peters, and Pym (1977) find that disasters have a complex history in which the trail of failures only becomes apparent after the crisis or disaster. After analysing seven human-connected disasters, these authors found that hindsight information comes much easier to mind in assessing the cause-and-effect than *insight*. Insight requires more mental effort that continues past confirmation of intuitive or hindsight-based conclusions.

Hindsight judgements based on apparent and glaringly obvious trails of misjudgment and error are probably convenient psychological tools that help most of us come to terms with a disaster. We can vent anger and frustration on the apparent "bad people" (and on the system) and ignore the insight into our own failings and imperfections that contributes to such events happening. We can, for example, claim that those found in error were criminally negligent. At the same time we may acknowledge that -- to keep our jobs, to still interact with the people with whom we wish to interact, to "keep the peace" -- we are selective about what we say or do. Most of us dislike "rocking the boat". Hindsight judgements allow us to condemn others for what we ourselves do, and thus account for the crisis event as an irregularity that has consequently been accounted for by determining blame for allowing the event to happen. With such judgements, we can revert to a comfortable if self-deceiving acceptance of a stable and appeased environment in which crises and disasters do not, of course, happen.

From the position of an evaluator, the effect of hindsight biases may be reduced by:

- establishing a sequential cause-and-consequence chain that remains focused upon the situational facts at each cause-and-consequence link,
- attempting to recreate the actual set of events or cause and chain links,
- separating intuitive solutions from hard factual information, and,
- searching beyond hindsight induced solutions.

The key process is to try to work within the confines surrounding the crisis management and try to see what the crisis managers saw. In this way, evaluators try to work with the "facts" as these became apparent to the crisis managers. Complex investigations often use cause-and-consequence information to simulate the crisis event. One such example of this recreation of the event is that undertaken by aircraft accident investigators who use black-box information to reproduce what was happening in the moments before a crash happened.

Time Distortion in Crisis Events

In crisis situations, each person's sense of time may become warped or distorted due to the intensity of the experience. Time may take an *expansionary distortion* in which experienced sensations seem to last longer than they really do. Most people who experience the shaking of an earthquake exaggerate the duration of shaking by between 4 to 10 times the real duration. Thus a quake lasting 5 to 10 seconds may *feel* like 30 to 100 seconds. Incidentally, people also report ground and structural movements to be bigger than these movements actually were by between 5 to 50 times size of motion. These reports are due to the sensitivity that the human body has in feeling motion.

As people adjust to the reality of their experience of a crisis, they consolidate their mental images and cause-and-effect rationalisations which over time may become hard to dislodge "facts".

Expansionary distortion may also arise when adrenalin fatigue and tiredness sets in or when those experiencing intense events begin to consider all that happened. So much is recorded, felt, cognitively processed, and reacted to, that responders, victims, and bystanders often have trouble relating recalled data to a time sequence. On the Great Fire of London (1666), Samuel Pepys noted that:

And I lay down and slept a good night about midnight -- though when I rose, I hear that there had been a great alarme of French and Dutch being risen -- which proved nothing. But it is a strange thing to see how long this time did look since Sunday, having been always full of variety of actions, and little sleep, that it looked like a week or more. And I had forgot almost the day of the week. (Latham, 1990, p. 666)

Pepys illustrates here the distortion brought on by nervous stimulation, cognitive overloading and tiredness. His feeling that the fire had been going for "a week or more" instead of Sunday to Wednesday (four days) is a common distortion when crises are serious and prolonged. Note that rumour may be another product of crises, and this too is illustrated in this extract ("alarme of French and Dutch being rise").

Given the number of sensory impressions, thoughts, and actions gained and undertaken during a crisis, time may also undergo *compressionary distortion*. Here, time distorts in the opposite direction and appears to be less than that available or actually used. Sudden change often freezes humans and animals: seconds appear as milliseconds in which to act. Many crisis managers are likely to experience compressionary distortion. The sheer volume of decision

making, action stimulus, need for information and change in environment often appears to have taken longer than reality. After a change of shift, managers may find they are unable to fit all they recall experiencing into the actual time span of their shift.

Time distortion can be better handled by crisis respondents and evaluators through:

- accepting that time frames may warp through expansion or compression,
- establishing closer and more frequent recordings of events during a crisis situation,
- use of easy and quick to use recording instruments (such as action maps and patterned record logs) during the crisis situations,
- validating sequences and durations of events across a number of separate records, and,
- undertaking interviews and debriefings as close as acceptable to the time in which those being debriefed experienced a crisis situation.

While managers and respondents may feel any request to more frequently record their actions and perceptions as yet one more unimportant task, such efforts lead to quicker and more certain post-event reports and help greatly in refreshing memory when giving information or evidence at inquiries that may take place months or years into the future. Likewise, obtaining evaluation information as close as possible to the period in which the experiences were gained reduces the biases of rationalisation (making a coherent but possibly revised “story”) and of consensual revision in which information gained from other sources prompts revision to fit an accepted or authoritative source. By gaining information near the period and location of the crisis situation, evaluators are also more able to validate the time scales and information they gain.

Towards an Approach to Evaluating Crisis Management

By using the four evaluation components of crisis incident, environment, pre-impact management, and post-impact management, a more comprehensive and focused approach to evaluating and assessing crisis management can be developed. Each of these four interdependent components can be analysed by looking at the structures, systems, processes, and people involved (see Figure 2).

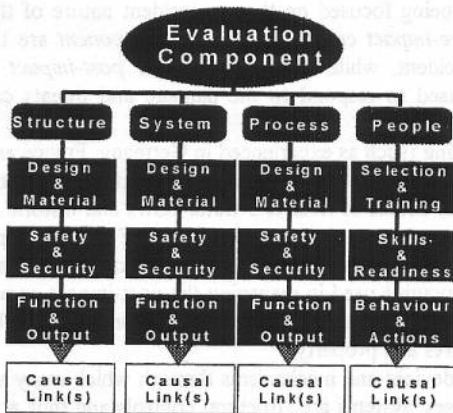


Figure 2. Assessment Methodology for each Evaluation Component

In Figure 2 each evaluation component is separated into four streams of investigation. Each of these streams covers a dynamic and interdependent aspect of the component and so care is needed to identify connections between each stream. The connections can be traced in most cases from left to right -- from structures to systems to processes to people. Each stream proceeds through three primary assessment tasks to guide evaluators toward establishing the **causal link or links** the evaluation of the stream uncovers. These causal links often interdependently fit together across the streams and form a causal chain of links that sequentially describes the what-where-when-how-consequence of each moment of the crisis situation.

For the structure, system, and process streams the three primary assessment tasks are: design and construction, safety and security, and function and output or outcomes. For the stream involving people the three primary assessment tasks involve examining how the particular people or groups of people were selected (and/or were on-site for the onset of the crisis situation) and what levels of training they had at that time, what skills and levels of readiness to cope with the situation were held by each relevant group or groups of people, and what behaviours were displayed and what actions were undertaken by each relevant group or groups of people. By investigating each of these areas, evaluators are able to identify the strengths and weaknesses in crisis preparedness, look for ways in which crisis situations may be prevented from arising, seek ways in which the effects or impacts of a crisis situation may be reduced, and suggest ways in which management responses to a crisis situation may be improved.

Structures. Structures are those human-made or natural formations that are present in the crisis situation. Thus volcanoes, earthquake faults, rivers and geological ground features are structures, as are vehicles, buildings, manufacturing plants, and community constructions. Structures may also need to be divided into discrete structures for investigation -- engines, for example, being looked at separately from other equipment or the structure housing engines and equipment. *Structures examined in the crisis incident component* include the structure or structures containing the crisis incident. *In the environment component*, structures examined include those human-made or natural formations that suffered damage from the impact of the crisis incident -- the examination being focused on the pre-incident nature of the structures. *The structures explored in the pre-impact crisis management component* are those used to respond or counter the crisis incident, while *those used in the post-impact management component* are those structures used to respond to the damage and threats caused by the impact of the crisis incident.

In a simple example of flooding (such as experienced in Germany, France and Holland in the past few years) the river(s) that flooded are the structures included in the crisis incident component evaluation. The general details of river and water flows and historic records form structures explored in the environment component. The status of any flood prevention or mitigation structures (dams, levees, flood barriers) are structures examined in the pre-impact management component, while structures used in managing the post-impact component range from boats and temporary prevention structures to temporary accommodation buildings and impacts on community infrastructures and property.

Systems. Systems are the devices and mechanisms through which many structures are operated or managed. In most cases, systems are structural controls and thus are particularly vulnerable to damage in crisis situations or are the primary source for crisis incidents. Particular attention needs to be paid to systems that deliver early warnings and warnings on

status change in systems or structures, and to systems that are designed to regain control or mitigation (pre-impact) or response management (post-impact).

For crisis response management the organisation of the crisis response effort (and of each of the responding agencies) needs evaluation alongside the physical mechanisms used to exert control and response effort over other systems or structures. The evaluation needs to explore the established tactical and strategic response management structures, the strategic planning and management involved in preparing for crisis management, the contribution of chains-of-command, information management (from data collection, validation, and exchange to communication interactions with people outside the crisis situation and with media representatives), the management of victims (and of victim identification and public enquiries about potential victims).

Process. Process aspects are the human-based systems for managing operations, dealing with crisis situations, and managing human interactions. If systems consist of the "what" is used to do something, then processes are the "how" these systems are managed by humans. In the fire on the train in the Chunnel (1996), structures assessed would include the tunnel, the train, and the lorry that was the originating source of the fire. Primary systems that needed examination included warning systems, capability of power and infrastructural systems to continue in adverse conditions, communications systems, and outside response warning and communication systems, alongside fire suppression systems used on site and evacuation systems used to rescue passengers and staff. Processes that needed to be explored in this crisis would be those used to manage use of the above systems and the communication and decision procedures used before, during, and after the incident.

People. The stream containing evaluation of the behaviours and performances of people in crisis situations is most important -- people have to manage (or ineffectively manage) crisis situations and people often create the conditions in which crisis situations will arise. The people stream covers how people act and react to crisis incidents and is central for any evaluations aimed at improving the management response to crisis situations. People can be sorted into victims (those physically or psychologically impaired when in immediate contact with the crisis situation), bystanders (those not impaired but who do not respond to the situation), and respondents. In many cases, the respondents category can be usefully divided into first-on-scene or first-arrivers, professional response personnel, volunteers, and logistical support groups. Where appropriate, these groups may be further sub-divided into strategic management, tactical or on-site management, and response delivery personnel.

The people caught within the crisis incident are the obvious subjects for the crisis incident evaluation component. Those groups involved in making, testing, using and maintaining the structures, systems, and processes become the subjects of evaluation in the environment evaluation component. Pre-impact and post-impact groups of people for evaluation tend to cover the more traditional victims, bystanders, and respondents along with the relevant sub-groupings.

Conclusion

This paper briefly outlines an approach to evaluating crisis situations and crisis management that can be used in formal or informal investigations. While an internal evaluation of a crisis management exercise may only find a need to focus on pre-impact and post-impact management aspects, the presented approach provides a fuller methodology for assessing and analysing issues involved in a crisis situation and the management of that crisis situation.

Any effective evaluation needs to use a broad approach to enable any contributory links in the crisis causality chain to be identified and thus lead to suggestions about how the causes of crises can be removed or reduced, the damage and costs caused by crisis incidents can be mitigated and lowered, and how management of crisis situations can be improved. Such an approach needs to be able to be used in assessing management of recovery from crisis. Evaluators need to seek hard information or objective fact and move beyond convenient intuitive guessing or a search for the most likely scapegoat. Likewise, evaluators need to be continually aware of the effects of biases (particularly hindsight biases) and time distortions upon remembered "facts" and upon the judgements made by the evaluators.

The approach proposed in this paper separates the crisis situation into four components - environment, crisis incident, pre-impact management, and post-impact management -- and establishes a four-stream sequential analysis to systematically seek cause and consequence links. By using this systematic approach evaluators, professional witnesses, and members of inquiry boards and commissions are more likely to identify more of the contributory causes of a crisis and be able to recommend improvements that reduce the incidence and consequences of crisis incidents and lead to better management practice in handling crisis situations.

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