

# THE APPLICATION OF RISK MANAGEMENT PRINCIPLES TO CRISIS MANAGEMENT IN CONSTRUCTION

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A prayer by St. Francis reads "Give us the strength to change the things we can, to accept the things we cannot change, and the wisdom to know the difference". The first part (and, to an extent, the third part) of this message is embodied within the practices of Risk Management. The second, an acceptance of some possible occurrences, lies more in the area of Crisis Management. Crisis Management does not mean a blind reaction to situations, but involves some proactive preparation for unwelcome and unpredictable disasters which are an occasional part of the construction process. The literature on Crisis Management goes back over 20 years, and uses definitions of Crisis Management along the lines of "*any incident that can focus negative attention on a business or project and that can have an adverse effect upon its overall financial condition, its relationships or its reputation*".

Any proactive organization should emphasize the importance of identifying risks and take appropriate measures to minimize the likelihood of crises developing. Crisis Management planning requires a blend of skills with an effective team approach. Designated back-up may also be needed. Staff must be trained and regular scenario planning will develop an ability to reduce the effects of any crisis. In construction, the most likely crises will be safety-related, but litigation, environmental problems and damage to public services are also very common. Applying techniques of Risk Management to Crisis Management planning is a logical development. This paper will make recommendations as to how the construction industry might become more effective in preparing for and managing the crises which may arise.

Keywords: crisis management, perception, risk avoidance, risk.

## INTRODUCTION

Risk management continues to play an increasing role in modern construction projects, dealing with financial issues, contractual issues on apportionment and operational issues such as health and safety. Crisis management, on the other hand has been widely regarded as a reactive process to deal with crises as they occur and there has been little research into construction crisis management. There is a very indistinct dividing line between risk and crisis in construction and, as a result, some approaches to risk management can be equally successfully applied in creating a proactive crisis management environment within construction organizations.

## A CRISIS OR AN UN-ASSESSED RISK?

When an incident occurs during the construction phase of a project, can that incident be immediately labelled as an unexpected event or as the occurrence of a risk which had not been identified or properly assessed during the project planning stage? There

will be varying opinions on the answer to that question and this variety will be an expression of the breadth of interpretation which exists in respect of what type of incident constitutes a risk and when, if ever, does that risk translate into a crisis.

Definitions would suggest that the difference lies in two areas, the predictability and the potential outcome of the occurrence. A risk is an event which may or may not occur based upon an established probability level; in the event of such an occurrence, the outcome is substantially predictable. On the other hand, a crisis is also an event which may or may not occur but without the benefits of probability underpinning (i.e. in the realms of uncertainty). In the event of a crisis occurring, lack of stability creates an incidence of time where the potential outcome is substantially unknown.

A clearly defined boundary between a risk and a crisis does not exist. Risks can easily translate into crises if the predicted outcome is incorrectly determined or assessed. Similarly, crises may be avoided at best, or minimized at worst, if the potential incident is firstly identified and secondly assessed as a potential risk with appropriate action taken. Perhaps the use of a scenario may be beneficial at this point.

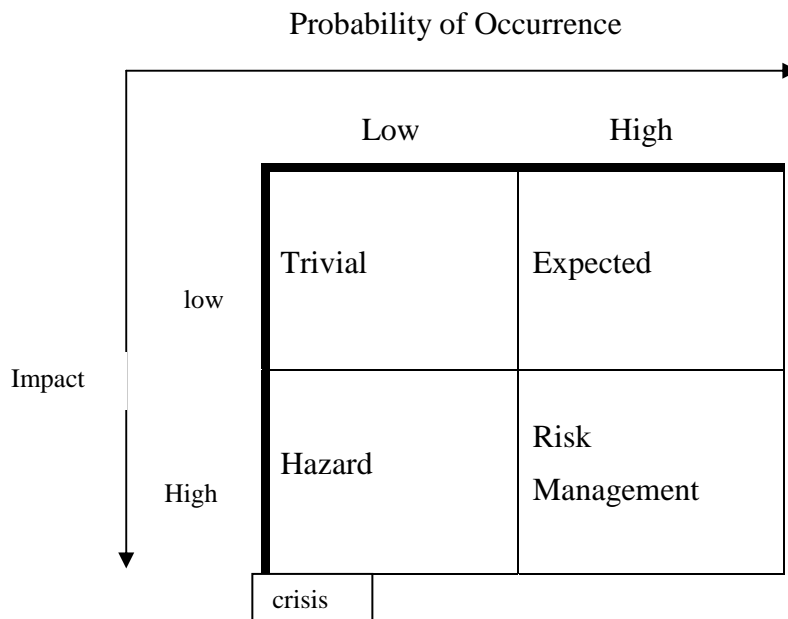
Take the example of a list of contractors invited to tender for a commercial project in a city centre location on a redevelopment site surrounded by other commercial property. The tender documents advise the contractors of the high incidence of existing services in the area and require the contractors to liaise with the appropriate public utilities in the establishment of the nature and exact location of each service. The successful contractor commences work on the site and, during excavations, ruptures a large water main and damages the nearby electricity main. This causes considerable damage in the immediate area, serious surface water problems and loss of electricity to the neighbouring premises (with substantial financial implications as a consequence). Does the above scenario represent a crisis or an un-assessed risk? Looking at the problem retrospectively, the occurrence was undoubtedly a crisis, in fact a substantial crisis. The next question to be addressed is to establish the cause or causes of the crisis, a process of debriefing and analysis, which should always occur in any organization following a crisis, in an effort to reduce the likelihood of repeat scenarios in the future. Again from a retrospective viewpoint, the crisis occurred because due diligence and care were not exercised in the recognition of the potential risk, as identified by the tender documents, and of the inadequate assessment, or non-assessment of that risk. The occurrence may now be seen as an un-assessed risk. This example certainly suggests that a 'grey area' exists between crises and un-assessed risks. This type of ill-defined area fosters the development of varying opinions and perceptions by individuals and organizations.

## **RISK FACTORS – THE CONTRACTOR'S PERCEPTION**

The scenario above was looked at in retrospect and, as a result, the occurrence could be identified as both a crisis and an un-assessed risk. However, at tender stage, the concept of such an occurrence happening would normally have been interpreted as a risk, requiring due consideration and assessment. It would be particularly difficult to imagine that a contractor, when tendering for the project with all available information to hand, would overlook the potential risk of existing services and consequently allow such a catastrophe to occur. However extreme the scenario might be, it highlights the fact that there is a difference between a crisis and an un-assessed risk, but that difference is perceived through the eyes of the contractor.

When reference is made to the contractor's perception, interpretation may suggest the approaches, opinions, values of an individual or it may suggest that the perception of the contractor, as an organization, is an amalgam of team work, a very valuable tool in risk management processes. It must be seen as an advantage to pursue the latter approach as a means of unfettered consideration and debate.

Smith (1999) divides risk sources into four categories (see Figure 1) and postulates that risk from each quartile will be dealt with in a different manner. However, if the model, which is useful as a generalized approach, is adopted by various tendering contractors, each with their unique perception of risk factors, the clearly defined boundaries of the figure will become fuzzy and ragged as the transition becomes clouded.



**Figure 1:** Classification of Risk Sources

The perceptions of each contractor tendering will influence the particular way in which the risk sources will be classified with the result that an occurrence, which may be perceived as a risk to one contractor and dealt with accordingly, may be perceived by another as remote and trivial and subsequently assessed in accordance with that perception. This will result in the above generalized model being adapted to concur with each individual contractor's risk policy (i.e. perception of risk)

If a crisis is viewed as a very high impact/very low probability occurrence, it can be assessed in a similar fashion to a risk. Many commentators view events with very low probability as being too "remote" to consider as a risk. However a strategy of risk allocation might include such unlikely occurrences as potential crises, and share responsibility for their effects. A number of factors which are often regarded as "construction risks" such as ground conditions or structural design, might cause dramatic outcomes – or crises – should the worst possible case develop. Such scenarios may be viewed as being at the bottom end of a risk exposure diagram, with a maximum downside risk, but can still be treated using risk management techniques and risk sharing strategies.

## **RISK IDENTIFICATION**

If risk factors are identified by perceptions of the outcomes of possible occurrences, why do individuals view these outcomes differently? Why do some people view a situation as a significant risk and deal with it as such, while others consider it as a trivial issue deserving special consideration?

The implications of heuristics and biases for construction have been summarized by Flanagan and Norman (1993). These are in addition to the personal experiences of individuals involved, imposed requirements and prevailing culture.

As the number of individual perceptions are almost infinite, so the number of reasons behind a contractor's interpretation of any given scenario will be similarly large, but it may be prudent to identify some of the factors likely to be considered as a means of continued understanding

- Previously recorded events and their outcomes
- Experiences of members of the contractor's organization
- Track record of key on-site personnel
- Requirements of financial backers
- Previous experience of Client and Design team
- Current tendering climate

Each of the factors listed above may influence a contractor's perception of the potential risks associated with a project and how those risks will be dealt with. Upon examination of the list, it can be seen that some of the factors will be project specific which in turn suggests that a single contractor may deal with the risks differently on a project to project basis.

## **RISK MANAGEMENT TECHNIQUES**

Techniques of managing risk in projects are numerous and diverse, often designed to meet the particular needs of an organization and its market place. However, in the United Kingdom, the most widely used model in the construction industry originates from the HM Treasury (1994) guidance document. The model has three components;

- (1) Risk Identification,
- (2) Risk Analysis,
- (3) Risk Response

Although complex techniques for the management of risk are useful within defined circumstances, simplicity needs to be paramount in any attempt to link risk management and crisis management in construction projects.

The optimal implementation of the risk identification stage is vital to the whole process. It is important to utilize all of the organization's resources in the process of dealing with risk at this stage. Useful outcomes can be the result of well constructed 'brainstorming' sessions with carefully selected group membership. One of the main advantages of such sessions, as evidenced in Value Management programmes, is the freedom to contribute and the triggering effect that such freedom encourages.

Subsequent interviews with other experienced personnel and referrals to historical data will further contribute to risk identification. It is vitally important that when the predominant risks have been identified that the discarded residue is retained for consideration by the crisis management team. Risks, identified as being significant and requiring further consideration, will be analysed by available appropriate means and final decisions on contractor response will be taken at tender submission stage.

## **CONSTRUCTION CRISES – UNIQUE OR POTENTIALLY PREDICTABLE?**

As suggested in the introduction, the possibility of a particular crisis occurring may range from the totally unlikely to the quite probable. The risk management approach will direct managers to devote more time and effort to preparing for the more probable situations, whilst giving little consideration to the less likely ones. This may be an over simplification of reality.

Increased awareness of potential crises and appropriate preventive action will undoubtedly reduce the incidence and effect of crisis situations. Risk identification and provocative “what if?” scenario analysis can play a major part in crisis prevention. There is also the possibility of a “domino effect” whereby one crisis may produce a magnified knock-on effect. Effective crisis management planning will have already examined the potential impact of a crisis on the organization’s operations and financiers, as well as upon the general public and the construction industry itself.

Whilst every crisis, like every construction project, may be considered as unique to some extent, there is a pattern of predictability. For example Reid (2000) conducted a survey of 149 construction organizations in the USA, which found that the top 3 crises which they experienced in both 1988 and 1996 were site accidents, contractual disputes and damage to utility lines. Hence one can identify the most likely problems and act to avoid them, whilst recognizing that some unpredictable event remains a possibility. Some proactive preparation for such unwelcome and unpredictable disasters may make the difference between a minor and a major crisis.

## **CAUSATION AND EFFECTS OF CONSTRUCTION CRISES**

In addition to safety related occurrences, there are many possible crises in construction, ranging from serious pollution, financial difficulties, legal/contractual issues, labour relations matters (strikes, harassment, discrimination), structural difficulties and business practices to loss of central computer data or the death of a key member of an organization. Safety aspects are probably the best documented, as well as the most common, crises on projects and provide a model for dealing with other disasters. Natural disasters cause major problems in many parts of the world, and there are lots of lessons to be learned from how these have been handled (or mishandled) in the past.

Shrivastava and Mitroff (1987) have developed a generic matrix, identifying causes of crisis as internal/external to a project or organization, and Technical-Economic/Human-Social-Organizational systems as follows:

Cell one covers most industrial accidents (e.g. Bhopal, 3 Mile Island and Chernobyl). Cell two relates to hostile takeovers, macroeconomic forces etc. Cell three is associated with failures in internal social processes and systems, operator failures, psychopaths etc., and finally, cell four is related to sabotage, terrorism and product tampering crises (e.g. the Tylenol case). Shrivastava and Mitroff (1987) say that planning for crisis prevention must begin with the assumption that any of the crises shown in the chart above can affect the organization. They believe that an organization must evaluate the hazards of each product or process in their ‘business portfolio.’ This should lead to prioritizing the business for focussed crisis planning. The criteria they suggest for this evaluation are shown in Table 1 below:

**Technical-Economic Systems**

Major industrial accidents Product injuries Computer breakdown Defective, undisclosed info. Technical Errors Lack of resources  Internal	Widespread environmental destruction Natural disasters Hostile take-overs Societal crises (civil or political) Large scale systems failure Economic shifts Competition  Cell Two  <b>External</b>
Failure to adapt/change Sabotage by insiders Organizational breakdown On-site product tampering Illegal activities Occupational health diseases Incompetence Inertia  Cell Three	Symbolic projection Sabotage by outsiders Terrorism, executive kidnapping Off-site product tampering Counterfeiting Negative Media coverage Public pressure  Cell Four

**Human-Social-Organizational Systems**

**Figure 2:** Crisis Trigger Matrix

They go on to say that “the strategic management of corporate crises must deal with both prevention and coping, and must occur at the corporate and business unit levels” (Shrivastava and Mitroff 1987). The aim here is to reduce the crisis potential of a corporation through the design of safer technology portfolios, identifying likely sources of crises through regular crises audits, and the establishment of crisis teams.

**Table 1:** Evaluate Criteria for Measuring Crisis Potential of Technologies

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1	Intentionality of harm (high, moderate, low)
2	Spatial reach of harm (square miles or radius around facility)
3	Concentration of releasable energy (catastrophic, high,.....low)
4	Persistence of harmful effects (days, weeks,....years)
5	Mean time between failures (days, weeks,.....years)
6	Population at risk (number, demographic, characteristics)
7	Delay time between exposure and harm (minutes, hours, days)
8	Human mortality caused by the technology (Average and maximum)
9	Non-human mortality caused by the technology)
10	Transgenerational risk (%affected in the next generation)

Based on these measures a composite index of crises potential of each technology can be calculated

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Shrivastava and Mitroff (1987)

Pearson and Mitroff (1993) have identified four major crisis variables, namely types, phases, systems (causal and preventative) and stakeholders affected by the crisis. Managers need to enhance their capabilities to deal with each of these, in the knowledge that rectifying deficiencies will not leave their organizations invulnerable to unpredictable crises. A systematic integrative process requires creativity rather than a fixed plan. The recent UK Foot and Mouth epidemic provides one illustration of how to mismanage a catastrophe. It is often felt that one can learn more from mistakes/failures than from successes, although each is a learning opportunity.

Responses to crises may be both individual and organizational, with a range of short term, intermediate and long term effects. Individual responses start with excitement or withdrawal, followed by anger or denial and culminating with a degree of satisfaction or dissatisfaction which may accompany physical and behavioural effects.

Organizational responses in the short term may be alteration in group cohesion, centralization and outlook. Intermediate responses may include staff changes and revised assumptions. Long term actions may be growth or decline, varied systems, altered goals and values and a new strategic approach.

Effective crisis planning will include an estimate of the potential cost of a particular occurrence, and this will help in a cost-benefit assessment of risk. It may be difficult to reduce the short-term costs of a crisis, but effective management can certainly reduce the longer-term effects upon such aspects as public perceptions, reputation and financial backing. Proactive managers should carefully monitor for trigger events, which might result in a crisis, and draw on previously developed plans and teamwork to avert the worst outcomes. Effective communications at every level, and with every useful individual contact, will also help to reduce the impact of a crisis, even if it cannot prevent the actual situation from arising.

## **PROACTIVE CRISIS MANAGEMENT**

The first step in proactive crisis management is to establish a crisis management team with a range of personalities and expertise, under an internal leader. A clear chain of command, with effective job descriptions and appropriate back-up (stand-in) staff is essential. Adequate resources and operating procedures are required, similar to those of a quality management system (ISO 9001:2000).

Staff should be provided with the necessary information on organization/project history, and an official spokesman should be appointed. His/her role will be to present the best possible case in a professional manner, possibly buying time to establish the key facts. Damage limitation will be helped by appropriate openness, accepting a degree of responsibility if necessary, and by focussing on what aspects of the situation can be controlled. Media comments must be rapidly reviewed and responded to where required. It is usually unhelpful to have more than one spokesperson, in the interests of consistency.

The core crisis team is relatively small (leader, spokesperson, senior company manager and legal advisor, for example), but may need to be supplemented by technical, safety, quality and environmental experts, as well as by human resource/labour relations advisors, insurance brokers and external consultants. The small core team will have the greatest involvement in handling the crisis, but should have established relationships with the others in advance of the disaster.

Training of the crisis management team should include audits of case histories, simulations, "what if?" analysis and role-playing. Real life experiences will, of course, be the best trainer, and the handling of every crisis merits thorough evaluation, possibly led by an external adviser. Post Crisis questionnaires shortly after an event should identify potential improvements and prevent recurrence. Team leadership should ensure rapid response and use the crisis (or near crisis!) as an opportunity to improve cohesion, harmony and efficiency. Recovery of image following a crisis is an important role of the management team.

## **A FRAMEWORK FOR CRISIS MANAGEMENT**

Crandall and Menefee (1996) have identified steps, which should be taken in advance of, during, and after a labour relations crisis, which might be applied to almost any construction crisis. The most important of all of these would appear to be the formation of an effective crisis management team. A well trained team will control what Loosemore (1998) has identified as the three ironies of crisis management in construction projects. These are that collective responsibility, effective communication and mutual sensitivity between project members are less likely to the time of a crisis when they would be most important. He found that there are changes in interpersonal behaviour, increased reliance upon legislation and contract conditions and emergence of conflicting coalitions during the course of a crisis.

Low profit margins and low risk sharing in many construction projects contribute to the spiral of stress during a crisis, which needs to be dissipated. The maintenance of trust within the team may be helped by the clarification of problematic issues and the proposal of equitable solutions. It is important to ensure the survival and stability of the project and of the organizations affected by the crisis. Staff need to have their confidence and perception of ability to cope reinforced during the event.

Pearson *et al.* (1993) produced a checklist of actions which should be undertaken by a crisis management team. These range from strategic/technical/structural, through evaluation/diagnostic actions to communication, cultural and psychological improvements. In other words, a full range of hard and soft activities are required for effective management of a crisis, involving learning from history and training for effective responses.

## **RESEARCH AGENDA**

Research into Crisis Management necessarily adopts a primarily retrospective approach. Examination of successful and unsuccessful case histories provides one major way of understanding how crises occur, with the aim of developing proactive strategies to reduce their effect. Loosemore (1998) cautions that over-reliance on proactive strategies deflects attention from the need to build resilience within organizations to deal with the unexpected.

Another, more proactive approach is to examine the state of preparation and planning for disasters, and the extent to which some of the strategies and practices outlined in this paper are being adopted in construction organizations. We would predict that the state of readiness will be disappointing, but this answer itself might galvanize the industry into better preventive measures. Crises are sensitive issues, where individuals may feel threatened, and may exaggerate their successes in interviews or questionnaires.

Loosemore(1998) has utilized a reactive research methodology in studying communication patterns during a crisis using a diary study. Behaviour in a construction crisis was also studied by means of semi-structured interviews. The inherent uncertainty of crises makes this a time-consuming and a responsive approach. Indeed, all reactive research into crisis management presents difficulty in developing generalized theory from specific or unique occurrences and individual behaviours.

Equally there is a clear weakness in much current research into risk management, requiring a radical review. Complex mathematical models have not helped in managing real projects. Risk behaviour and perceptions are proving a fruitful field of



research, and a developing body of well-recorded risk experiences is providing the basis for practical learning by practitioners and researchers alike.

The authors believe that researchers into risk and crisis management should also concentrate on the fundamentals of human behaviour and decision making, rather than merely relying on elaborate mathematical models or opinion surveys. A soft systems methodology must be combined with the traditional hard methodology of risk management (Mootanah 1998) if crisis management research is to be of benefit.

## **CONCLUSIONS AND RECOMMENDATIONS**

Crisis management has not received much attention in the literature of Construction Management. The industry is somewhat resigned to the possibility of crises, but little is done to prevent or alleviate their effects. This culture of resignation to crises needs to change with the elimination of the faulty rationalizations and mind-sets, which hinder efforts. The growing influence of risk management approaches, coupled with improved scenario planning, provide the key to more effective crisis management as discussed herein. Strategic and operational planning must include dealing with potential crises, and provide a core team with adequate resources to manage the situation.

Communication skills, particularly in dealing with the news media, must be developed and appropriate psychological approaches inculcated. Furthermore, researchers in the field of crisis management need to focus on the softer issues, using case studies which consider the essential human factors and which encompass the emerging chaotic paradigm of the construction industry (Gunning 1999).

It is often claimed that “prevention is better than the cure.” Hence crisis avoidance is preferable to crisis management, no matter how effective or proactive. Effective crisis management identifies the programmable decisions in advance and leaves staff free to manage the dynamic elements of the crises with “unfettered hands” (Fink, 1986). Risk management helps in the former, and communication and team-leadership skills assist in the latter. Hopefully this paper will have served to assist readers in researching a combination of these for a coherent approach to the difficult management of crises in construction.

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