

# Risk management with ERIC

Consultant John Carpenter provides a simplified framework to qualitative assessment of risk, aimed at those with less experience

This article is derived from training delivered by the author and is also specifically geared towards undergraduates and graduates. It sets out a simplified framework to the qualitative management of risks and which has the advantage of being suited to all project related risks (for example, analytical, technical, commercial, occupational health or safety) at either a strategic or a detailed level. The note complements previous articles<sup>1,2</sup> and aims to emphasise the benefits of managing risk through group discussion with an experienced facilitator.

## Introduction

Engineers involve themselves in many tasks in connection with civil and structural engineering projects, but above all else they manage risk. Unfortunately, the general need to manage risk has become caught up with designers' duties under Regulation 11 of CDM2007. This has led to a degree of confusion and in some cases much unnecessary paperwork.

It is suggested that our role, as structural engineers and managers, is analogous to the juggler who is trying to keep several spinning plates in the air. These plates can, to further the analogy, be labelled, for example: 'Fees', 'Resources', 'Programme', 'Quality control', 'Structural stability', 'Interfaces', 'Serviceability'; the list is often long. Rarely do we have all the fees we would like (or need), or perhaps the level of experience in the resource we are allocated is lacking. Programmes are often tight. We have to manage these items, and others, in the prevailing circumstances of the market or within the limitations of the technical analysis. If one of these plates falls to the ground then that is analogous to a financial loss, an error being made due to inexperience, or a failure to meet the programme, and so on. The consequence of this situation would be, at best, annoyance from colleagues or the client, or, at worst, a civil claim against us. Reference 3 illustrates how poor risk management leads to the latter situation. The juggler would lose his audience.

However, there are two 'plates' that are always present, and which we cannot afford to ignore, still less drop. These are symbolic of the well being of others i.e. the safety and the health of others affected by our decisions.

This note presents a way of managing all the 'plates' on the same basis. They all represent challenges (strictly, hazards) which may give rise to risk. Whilst it is argued that all project hazards can be dealt with in a unified manner, there is one significant difference between those issues relating to the well being of others, and other project concerns. It is that whilst we could (foolishly but legitimately) ignore the potential difficulties arising from, say, a lack of quality control, and just keep our fingers crossed that all will be well, the law does not permit us to ignore the consequences of our decisions on the health or the safety of others.

## Dealing with challenges

In any aspect of life – at home or at work – we face challenges. In all cases the ideal approach would be to take some action which removes the originating problem entirely. Be it family debt (by finding a rich relative) or project certainty (introduction of a strong client partner), elimination would be recognised as the optimum solution. Only if these ideal solutions cannot be found, which is more often the case than not, would we want to progress to the next obvious step of managing the problem which is still with us, so that it does not worsen, and hopefully shows some improvement. There are many ways in which these challenges can be contained so that

they will improve through our mitigating actions.

This approach to problems makes sense for the domestic situation, for general work related issues and, importantly, meets the legislative requirements for safety and health related concerns at work. In this latter field, we refer instead to hazards (something with the potential to cause a safety or a health problem) and risk (the way in which this might be manifested), to give them their correct terminology

The suggested model for this integrated risk management approach is ERIC. It has the advantage of being simple to remember and use, and of being a universal tool.

## Introducing ERIC

ERIC is, of course, an acronym<sup>4</sup>. It tells us not only what we have to do, but also, importantly, the sequence of action:

**E**liminate; **R**educe; **I**nform; **C**ontrol

The rules are that we must always commence at 'E'; must move through ERIC in sequence; and can only pass from E to R and to I if we have done all that is reasonable before doing so. When the action relates to the well being of others, designers only have to travel as far as 'I', as the control measures, necessary to effect a safe system of work, are the responsibility of those undertaking the work task itself e.g. steel erection, concreting, maintenance.

For these safety related issues the formal requirement, before moving on to the next letter, is to do things 'so far as is reasonably practicable'. The question arises 'when do we know if our actions are all that is 'reasonably practicable'? This is a difficult question to answer as the law is not clear (in a practical sense), and there is a dearth of real, practical examples, particularly those which tackle head-on the issue of solutions which cost money to implement. An ICE Panel, which includes Institution representation, has reviewed this subject in some detail<sup>5</sup> as a first step in resolving this issue.

In the absence of further clarification, it is the author's view that compliance with recognised industry standards (BSs, CIRIA guides, material sector guides-collectively 'good practice'), and reference 4, is a reasonable, minimum base level that should be met. However each situation will need to be considered on its merits and this suggested approach does not resolve all the uncertainties involved.

ERIC is best adopted with others, and in stages. Suppose a new commission has just been won and a team meeting has been called to discuss the project. The aim of this meeting (internal or amongst the professional team as a whole), is to identify all the strategic issues that, if not managed correctly, could cause problems. Examples might include:

The key to the meeting's success is to involve a good facilitator;

### General

- A client that is known to pay very late or is of doubtful financial standing.
- A key senior and experienced engineer being on long-term sick leave.
- The fee being just adequate, but nonetheless very tight (internal meeting only).
- A dearth of project information.
- Complexity/Unusual aspects.

### Occupational health or safety

- A dearth of project information.
- Significant public interface on a restricted site.
- Restricted site access.
- Contaminated site.

someone who has the wide experience, and communication skills, to help identify the areas of likely concern and to draw out the best from the contributors.

The ERI(C) model can then be used to work through these issues, first trying to eliminate, then, if this is not possible, to develop a strategy for coping with them and ensuring that they are contained. Having discharged these actions, critical information relating to the residual issues needs to be passed on to the wider team, finance department, or others. For issues relating to the safety or the health of others, the obligation at each stage is to do things as far as is reasonably practicable, as noted above. For the other challenges, the meeting can decide for itself, or take Directors' advice as to how much effort it should make at each stage.

ERIC allows this integrated approach to risk management to be taken; all problems may be tackled in the same manner. The philosophy applies across the board.

As the project progresses, the nature of these risk management meetings will change and become more of a detailed or specific nature. Issues relating to structural engineering have been described previously<sup>1, 2</sup> and include consideration of the robustness (in an analytical sense) of the analysis model, the validity of the outputs, checking and review regimes appropriate to the structure<sup>6</sup>. These, and others, are particularly pertinent as we approach the formal introduction of the Eurocodes. SCOSS has produced a note on the underlying assumptions<sup>7</sup> of the Eurocodes which link with the items highlighted above.

Detailed design will bring a further set of challenges to present to ERIC, many of which will interact with other members of the team, for example the architect, M&E engineer, or client. Splitting the project into manageable sections, as suggested in Reference 4, will assist in keeping the process manageable.

ERIC is a qualitative tool to be used by competent persons. Outputs are generally based on judgment, informed by contemporary good practice, rather than any notional (and somewhat arbitrary) scoring matrices.

This approach lends itself to simple recording of the matters

discussed; in bullet point or short statement format with outputs (the 'I' of ERIC) distributed to those who need to be informed. The file copy will provide the audit trail of an acceptable risk management process should evidence be required in the future. Whilst 'Risk Registers' can fulfil this function they are often only associated with the larger project and do not always give sufficient emphasis to the sequence enshrined in ERIC.

### Summary

Project risks should be managed on an integrated basis. In particular, the process of safeguarding the safety and the health of others, which has often been represented by the ubiquitous 'risk assessment', needs to be improved. This phrase does not describe what designers are obligated to do, and the actions associated with it have often generated paper without providing any added value. It is suggested that the use of ERIC as a group exercise (whether it involves two or 20 people), is an improved approach. Its strength lies in the fact that the acronym is easy to remember, it describes the necessary actions, and it can be used in connection with any type of project issue, thus giving emphasis to an integrated approach.

### References

- 1 'Practical application of risk management', *The Structural Engineer*, **81**/14, 15 July 2003, p19-20
- 2 'Reflections on structural safety', *The Structural Engineer* **80**/8, 16 April 2002 pp11-12
- 3 Reinforcing the simple messages, Griffiths & Armour, 2009
- 4 *Construction (Design and Management) Regulations 2007* Industry Guidance for Designers see website: ([http://www.cskills.org/supportbusiness/healthsafety/cdmregs/guidance/Copy\\_5\\_of\\_index.aspx](http://www.cskills.org/supportbusiness/healthsafety/cdmregs/guidance/Copy_5_of_index.aspx))
- 5 *A review of and commentary on the legal obligation to do something 'so far as is reasonably practicable'*, Institution of Civil Engineers Report, January 2010
- 6 Standing Committee on Structural Safety (SCOSS) Independent review through peer assist, Topic paper, 2009 see website: ([www.scoss.org.uk/publications.asp](http://www.scoss.org.uk/publications.asp))
- 7 Standing Committee on Structural Safety (SCOSS) The assumptions behind the Eurocodes, Topic paper, 2009 see website: ([www.scoss.org.uk/publications.asp](http://www.scoss.org.uk/publications.asp))

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