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Personal View: Why is Management of Risk so Important as we Enter the Twenty-first Century?

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BACKGROUND

RISK ASSESSMENT is nothing new. In the thirteenth and fourteenth centuries when some of our famous cathedrals were built, the danger of a structural failure was assessed by the masons at that time by observation. Where stresses were thought to be at risk, buttresses were added to give additional support to the structure. This system appeared to be remarkably effective as many of these cathedrals are still standing today, some seven centuries later.

More recently, risk assessment has become a scientifically based technique. It is supported by computer-based analyses and is becoming a tool to be used with all major and many minor projects to help identify and prepare the way for effective management of risk issues. This means it is now within an engineer's competence to understand techniques of risk assessment and management. From being a technique using observation and judgement based on experience in the Middle Ages, it has passed into a sophisticated, scientifically based technique using the latest computer technology of which all engineers and technicians need to become aware and informed. In the future these techniques, and an understanding and awareness of risk assessment and management, need to become part of an 'engineer's kit of tools'. It is hoped that all engineers and technicians will be introduced to this subject during their initial formation education and training; they will also need to update their knowledge and skill in this area through continuing professional development.

SOME PERSONAL VIEWS

There are many definitions of 'risk'. I like the broad statement 'Risk is the chance of an adverse event'. In my experience, 'risk' precedes 'safety'. By this, I mean that it is necessary first to identify and analyse risk issues, then in assessing and managing them it is essential to provide an antidote which is likely to include the adoption of safe practices and to ensure they are carried out.

I have spent my life in the construction industry and what a risky business it is, as Fig. 1 shows. However, the Engineering Council's study of risk issues started as a result of a series of national disasters which hit the headlines, not in the construction industry, but across the whole field, e.g. Flixborough, Chernobyl, Clapham, Zeebrugge, King's Cross, Piper Alpha, the Challenger space shuttle, the M1 air disaster, and many others. The consequences of such disasters are profound and tragic, and costly in terms of human life, as well as in their emotional and financial impact on the people and organisations involved. The working party, as one of its first tasks, reviewed the reports of some of these disasters to see what lessons could be learnt.

LESSONS FROM PAST DISASTERS

The lessons can best be summed up in a statement made by the Archbishop of York on 23 April 1989, following the Hillsborough disaster. 'Disasters happen because a whole series of mistakes, misjudgements and mischances happen to come together in a deadly combination'. If we are to reduce the accidents we need to study good practice and be constantly vigilant and systematic in our approaches to design, manufacture, construction, operation and management. Engineers have a key role to play. They need not only to apply their professional practice, but also to communicate that best practice to others, including the public.

THE TEN POINT CODE

I believe that most registered engineers and technicians will welcome the Engineering Council's ten-point code. This comprises the following:

1. Professional responsibility.
2. The law.

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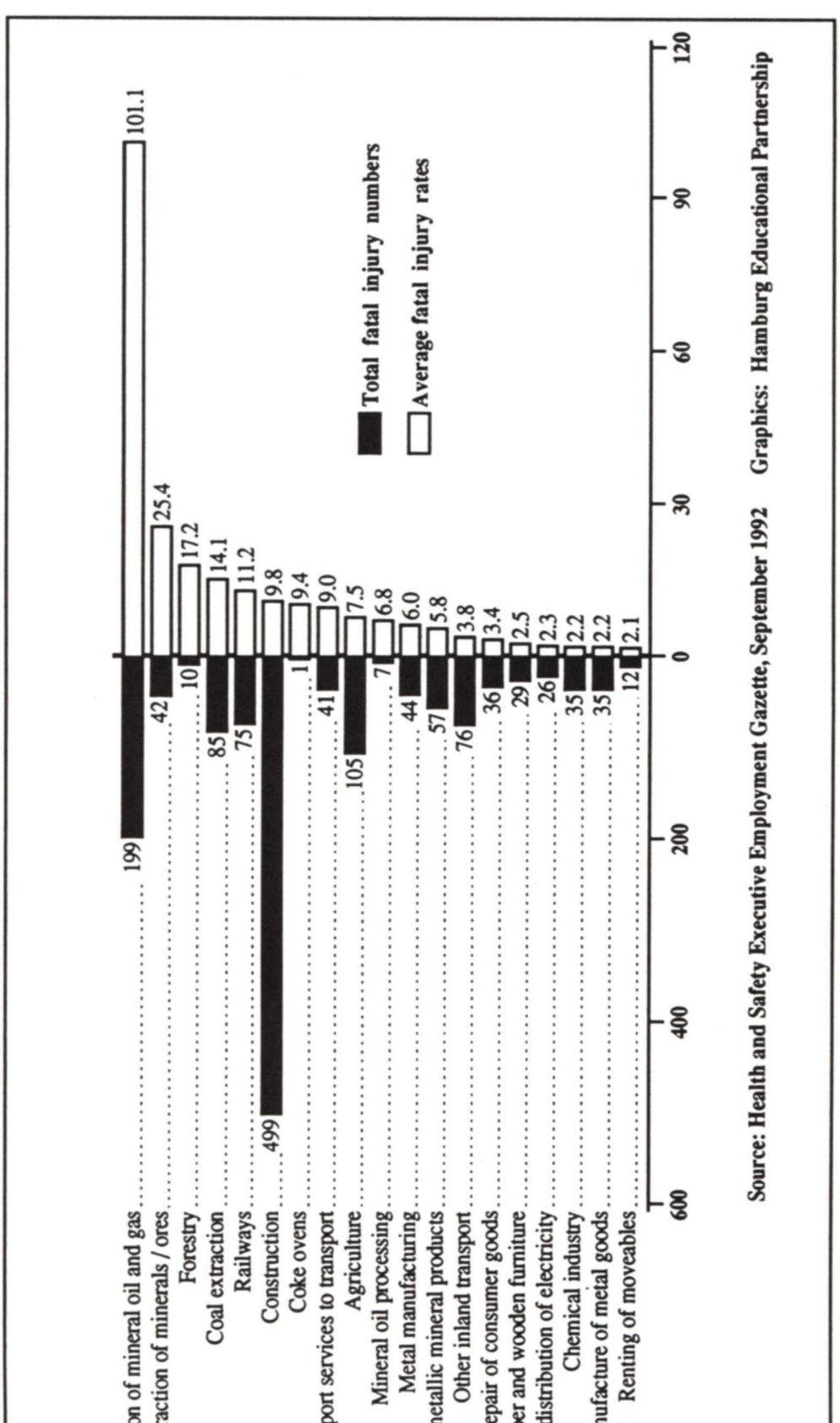

Fig. 1. Industries with employee fatal injury rates over 2 per 100, 000. Average rate 1986–7 to 1990–1 by SIC80 class.

3. Conduct.
4. Approach.
5. Judgement.
6. Communication.
7. Management.
8. Evaluation.
9. Professional development.
10. Public awareness.

This will be a useful guide to help them ensure that they follow good practice. In the same way that a good driver will welcome the Highway Code, which he or she will normally follow and keep in mind when driving, and has The Road Traffic Acts as a backing, so the risk code has backing through the Engineering Council's Bylaws and Rules of Conduct. In the unlikely event of a registered engineer or technician flagrantly breaching this code and acting in an unprofessional manner, he or she could face disciplinary action which might involve a caution or counselling session, or ultimately, could lead to deregistration of the individual. Any such action would normally be undertaken in conjunction with the individual's own professional institution.

This, we believe, will be very rare. It is the negative side of the code which is unlikely to affect more than two or three out of the 290,000 engineers and technicians on the Council's register in any one year. The positive side, is that it can be the best insurance policy that an engineer can have to avoid ever being disciplined in this way. It is the first code of a series proposed by the Engineering Council. Codes of professional practice were recommended, in principle, in the Finniston Report and are also called for in the Council's Charter and Bylaws. The next code, due to be developed, will be on the environment. Consideration is being given to following this by a code of professional practice on continuing professional development (CPD).

WHAT DIFFERENCE SHOULD THE CODE MAKE TO THE AVERAGE ENGINEER?

When I was a young apprentice in the construction industry, I regularly suffered from nails in the shoes and toes. This was a frequent occurrence in construction, as workers walked over planks where nails were exposed. Today, the accident rate figures show a decline in accidents from such a cause. This has been brought about by the national encouragement of the wearing of safety boots throughout the industry. Such changes are slow to be brought about but once the trend is established it can gather momentum and eventually lead to safer practices throughout an industry. There is always a danger that trying to cut costs will encourage commercial interests to override good and safe practices, especially in a time of recession, where there is a shortage of work available.

In the long term, good professional practice is likely to be synonymous with good business. If corners are cut, and bad and dangerous practices undertaken the chances are that future business and repeated orders will be lost. Whereas, the responsible application of good practice, put into effect in a cost-effective and competitive way, is likely to lead to a sound reputation and to business growth on the long term.

Over the years significant progress has been made in encouraging better risk awareness and a positive attitude towards safety and health issues by regulatory bodies (e.g. the Health and Safety Executive) and other bodies involved in improving safety standards (e.g. Lloyd's Register of Shipping). This has been achieved by regular reviewing of best practice and the encouraging of progress by example, persuasion and by legislation. As technology advances at an ever-increasing rate, this helps to create the need for new and improved standards.

SOME POSITIVE BENEFITS

If the code is applied in a positive way, in the long term it should lead to some of the following:

(a) a significant reduction in disasters, accidents and incidents, and a consequent reduction in loss of life and injuries;
(b) if engineers and technicians are seen to be more responsible in our society, in the longer term, this is likely to lead to them being better recognised. As a consequence, they are likely to gain in status as a profession. Status in our society, about which many engineers complain, has to be earned the hard way;
(c) more engineers and also companies which they influence are likely to develop and follow systems which improve quality and standards, e.g. total quality management (TQM), BS5750 and IS900 and the growing number of other British and international standards associated with quality standards;
(d) all engineers and technicians should seek education and training in risk awareness. Depending on the nature of their business they may wish to extend this to embody risk identification, risk assessment, and risk management. Essentially they need to be up to date with the relevant approaches and to ensure regular updating. This may be achieved by attending technical lectures in one's own institution, or by attending specialist seminars or conferences, or by attending evening classes or by participation in a distance learning course.
(e) UK engineers and technicians will be seen to give a lead in setting standards. There is enormous scope in Europe and the international scene for better and more universal standards to be introduced and encouraged as well as systematically applied, and the Engineering Council wishes to promote wider awareness;
(f) engineering is constantly changing and the

capable engineer is likely to be at the hub of change. He or she needs to be aware of the changing pattern of materials—how fibre-reinforced and new plastics materials are frequently replacing metals. In the development stage such changes may introduce technical risks which must be carefully managed. Information technology is permeating the whole of our society and affecting the availability of information for databases and for control and management purposes. Here the engineer must avoid the computer and its output becoming 'a sacred cow'. Computerised data and analysis needs to be constantly challenged and the best solution will often result from the best information and computerised analysis, checked by experienced and professional judgement;

(g) as we progress into the twenty-first century, British engineers and engineering could once again become synonymous with best practice. This means that UK-designed projects would be better designed with risks minimized, and well managed with a high regard to safety. It is interesting to note that this code is already creating an interest in younger engineers and technicians and is likely to help attract more forward-looking young people into the profession.

Sir William is a prominent industrialist in the Civil Engineering industry and was Managing Director of Tarmac Construction. He is presently Chairman of the Black Country Development Corporation and also of the Engineering Council's Working Party on Risk Issues.