THE CHANGING FACE OF RISK MANAGEMENT¹

by G. N. Crockford²

In a static world, where the possibility of change did not exist, "risk" would be a superfluous term, or would at most express a metaphysical concept. Risk may be defined as the possibility of present circumstances being changed in some respect, entailing consequences which classic risk management theory has divided into "dynamic", "speculative" or "business" risks on the one hand, and "static" or "pure" risks on the other, according to their potential for advantage or disadvantage or for disadvantage only.

It follows therefore that all change has the potential to bring about the realisation of some risks, the elimination of others and the creation of a new set of circumstances, embodying new risks, which are in turn dependent for their fulfilment on certain future change.

Risk can be considered as a function of change, and risk management may thus be described as a technique for coping with the effects of change. It is a technique which has been formalised only in recent years, although many of its constituent activities have been practised to some extent for a much longer time. There are, however, grounds for fearing that while it is being formalised, the rate of change, the effects of which it is designed to control, is accelerating so rapidly that the more formal its techniques become, and the more they are thought of as a separate discipline requiring a new specialisation, created at the interface of economics, applied psychology, engineering of all kind, statistics, operational research, insurance, and occupational medicine, the less it will be capable of achieving, in practical terms, the purpose for which it was set up.

The pace of both technological and social change in the world has increased rapidly in the years since the industrial revolution, until it has reached an acceleration which many find alarming. Toffler³ has expressed it thus :

"Change is essential to man, as essential now in our 800th lifetime as it was in our first. Change is life itself. But change rampant, change unguided and unrestrained, accelerated change overwhelming not only man's physical defences but his decisional processes — such change is the enemy of life."

The evidence of change is all around us, and nowhere is it more apparent than in the world of industry, where risk management chiefly operates. The time-span between a discovery in a laboratory and its incorporation into standard technology is

¹ Paper presented at the Geneva Association Seminar on Insurance Developments within Industrial Companies, February 1975.

² Assistant Director, Keith Shipton Developments Ltd., London.

³ Toffler, A., "Future Shock", New York, Random House 1970, p. 430.

shortening all the time ; a newly designed chemical process plant may become obsolescent even as it is being constructed.

The industrial scene is rapidly changing from one where change happened at a pace which gave time for adjustment to it, time to adapt methods of action and thought to it, and time to handle it, to one where the future appears to be rushing towards the onlooker at a pace which makes ordered and adequate preparation for it impossible.

Industry formerly had a great deal of flexibility in methods of operation, in sources of raw material, and in markets. Industrial units tended to be small and the processes generalised. Markets tended to be local, and if a source of raw materials dried up, or a particular markets were lost, it was often possible to find an alternative source, or an acceptable alternative raw material, or to sell elsewhere.

As industrialisation has proceeded, concentration and specialisation have increased with size. Multi-national companies, the robber barons of contemporary mythology, occupy an increasingly important part in world trade, with interlinked and interdependent operations which seek to ignore territorial boundaries as far as possible.

Concentration has increased, not only in terms of value, with a consequent heightened risk of catastrophic loss, but also of dependency on single raw material sources, which carries with it the possibility of disastrous loss of earnings, not only for the producing company, but for its customers, and increasingly, the customers of its customers, as has been dramatically demonstrated by the explosion at the Nypro (UK) Ltd factory at Flixborough in 1974. Similarly, dependency on single customers, and dependency on a high volume of production to produce profit have also increased alarmingly. The economy of scale is accompanied, inevitably, by a market increase in vulnerability to the effects of change, which, it is suggested, has been insufficiently recognised.

Vulnerability to physical and liability loss is the area in which most risk management work has so far been concentrated, for many risk managers have tended to treat the area of risk which they are concerned as being co-terminous with the accepted areas of insurable risk, even though to do so is to limit the terms of reference of risk management even more severely than by restricting it to the field of pure risk. Damage by fire, flood, windstorm or other extraneous happening is increasing in severity because of concentration. Although that severity and the probability of loss may all too often be underestimated, and insufficient steps to be taken to prevent the occurrence, this type of vulnerability is usually recognised at some level of the consciousness of management.

Vulnerabilities, however, are not confined to the area of physical loss. Modern industry has also become increasingly vulnerable to economic, social and political change, any one of which may have effects every bit as devastating to a company as the physical destruction of its main production plant.

In earlier days it was often possible to adapt to such changes in time but in the rapidly changing modern world, change may overtake its harbingers.

A change in social attitude may increase risk by several orders of magnitude, or creates risk where none existed before. In the field of liability risks, the rise of militant consumerism offers a striking example. As a result of the tragedy of thalidomide, the

Distillers Company in the United Kingdom found itself having to make a very large payment in respect of a liability, the existence of which was never confirmed by the courts. Instead, a change in the social climate saw to it that the concept of a legal liability, which could, in the last resort, be defined judicially, was replaced by that of a moral liability, which can, it would appear, be whatever a sufficiently vocal and well-organised pressure group it says it is.

This case, too, illustrates once more the effect that size has on the increase of risk. The subsidiary company marketing thalidomide was a very small company by comparison with the giants of the pharmaceutical world, but it belonged to a much bigger group with large earnings derived from totally unrelated manufactures. The threat of boycott to those earnings was a powerful force encouraging settlement of a claim which might well have been successfully defended in a court of law.

Change in this non-physical sense threatens an industrial enterprise from many different directions and in a way that blurs the clear-cut distinction the text books draw between commercial and pure risk. Consumer pressures which push a company's effective liability beyond the limits laid down by law could be interpreted either as the operation of a market force, which would, in theory, be considered a commercial risk, or as a de facto extension of legal obligation, which could be construed as a pure risk.

In a modern world characterised by rapid change of this nature, therefore, risk management cannot have set frontiers. It must increasingly spread from the field of risks traditionally financed by insurers into the field of risks financed by bankers. It must increasingly be undertaken by managers who have hitherto enquired no further about pure risks than to ask whether full insurance is maintained. Risk management must become part of the function of all managers whatever their job title, and its techniques an expected management skill. Carter and Doherty put it thus : " the development of risk management is part of a more general development of management science " ⁴.

What is the aim of risk management science? Drucker supplies an interesting answer :

" The main goal of a management science must be to enable business to take the right risk. Indeed, it must be to enable business to take greater risks — by providing knowledge and understanding of alternative risks and alternative expectations ; by identifying the resources and efforts needed for desired results against expectations, thereby providing means for early correction of wrong or inadequate decisions " ⁵. In short, all management is risk management.

It should not be thought, because the ultimate responsibility for the management of serious risk will remain with the Board, that risk management is a technique to be used by top management only, with the technical assistance of a corporate risk manager. Responsibility for risk management, if it is to be effective, must be among the responsibilities of line management. These responsibilities should be made clear

⁴ Carter, R. L. & Doherty, N., " Handbook of Risk Management ", London, Kluwer-Harrap (1974).

⁵ Drucker, P. F., " Management Tasks, Responsibilities & Practice ", London Heinemann, 1973.

to managers both in the form of a policy statement on risk management and by the introduction of a semi-formal system for the recognition, identification, measurement and control of risk wherever it arises. Such a system should not take a narrow view of the range of risks for which risk management is appropriate, but should encourage staff at all levels to look for vulnerabilities whether in the domain of commercial or of pure risk, or in the borderland between them, and apply risk management techniques to them. Adequate reporting requirements must be included to ensure that appropriate financing action may be taken centrally for the residual risks.

Clearly, subjective judgements are likely to play a more prominent part in the assessment of, for example, political risks or risks of social change, but even here the fact that complete accuracy is impossible should not be an excuse for refusing to make the best possible analysis of the probability of particular risks occurring.

In the field of traditionally insurable risks, it is possible to obtain much more accurate measurement of risk, but all too often at present measurement is replaced by crude approximation or by mere guesswork. Numeracy is a pressing need for today's risk managers; it will be indispensable for tomorrow's.

The literature of risk management lays great stress on the importance of the measurement of risk, but the small space given in the text books to techniques of measurement, by comparison with that devoted to the other stages of the risk management process, suggests that measurement techniques are not so fully developed as are those of identification, control and financing.

Generalised probability theory is offered to the would-be risk manager, but rarely with sufficient indication of its application to practical risk situations. Even where exact measurement of risk is possible, it is frequently not carried out, and vague categories of hazard are used instead. It should be the aim of every risk manager to put the best numbers available to each risk, and to ban those non-quantifying quantitative adjectives which are the enemies of true risk management. Such words as "substantial", "high degree of", "slight", "reasonable", "significant", "considerable", "extensive", "major", "serious", and "relatively" imply subjective judgement by undisclosed criteria, and may even obscure what they are intended to clarify.

The use of numbers can only make for better understanding of the true loss potential, and make it as unacceptable as it should be to say after a disaster, "we had no idea it could be so bad".

With an explosion hazard, for example, it is possible, instead of making guesses about relative severity, to calculate the heat, entropy, and energy of a possible explosion, and to express its force in terms of TNT equivalent. From this, the overpressures at varying distances from the seat of the explosion can be calculated, and the possible damage pattern established. Applying this pattern to the constructions in the areas of different overpressures, it is possible, by making realistic assumptions of rebuilding costs, to calculate the total cost of material damage following the worst foreseeable explosion.

Similarly, a better appreciation of the fire hazard of a building can be obtained by analysing the ignition characteristics and the fire load, and the fire-fighting capabilities which are available, in quantitative terms.

Flood risks, too, could be better assessed by actual calculations of water flow, and of the susceptibility of the area to flash floods as a result of land by which rainfall could be soaked up, being covered by concrete. Longer-term climatic records, and forecasts of climatological trends can be used to assess the risk more meaningfully. The occurrence of wheather conditions which are "the worst since records began" or "the worst for 100 years" should no longer be a cause of surprise, but should be provided for in estimates of risk.

Available techniques for the accurate numerical representation of risks must be used to the full, and new techniques evolved to improve on them and fill the gaps in them, even though, in a fast-changing world, risks are subject to a version of the Heisenberg principle, and may well not remain unchanged long enough to be accurately measured. Updating procedures will therefore be necessary.

Accurate measurement, despite its difficulty, is the only basis on which the correct control and financing action can be taken. It is a necessity if, to adapt Lewis Carroll's all-purpose allegory, one is properly to distinguish between the snark of retainable risk and the boojum of catastrophe risk, which must be transferred. To fail to do that, is to risk the Baker's fate :

"In the midst of the word he was trying to say
In the midst of his laughter and glee,
He had softly and suddenly vanished away —
For the Snark was a Boojum, you see".⁶

Just as modern conditions require a more scientific approach from risk management, so insurance has room to become more scientific. At the time it was developed, insurance was a very advanced technique, but it is increasingly to be questioned whether that technique has continued to develop at the necessary pace, and whether it is now as advanced as it should be.

Its effectiveness, from the buyer's point of view, depends upon the preciseness with which he is able to quantify his insured values, the preciseness with which the circumstances of loss covered by policy conditions are those which threaten him, and the extent to which he can monitor the change in values at risk, and his methods of operation, to ensure that the methods of insurers are evolving as quickly as the risks they cover.

Insured values are often required to be in terms unrelated to values of the same items for any other financial purpose of the insured. Not only does this entail a separate exercise to check and maintain their adequacy, but the very unfamiliarity to financial management of the method of valuation used makes the monitoring of change more difficult. It may be mentioned at this stage that development work is in hand on a financial modelling technique which seeks to interpret insurance values in terms of net present value, a concept more readily related to the other financial affairs of the insured.

Underwriter's celebrated "instinct" may in fact produce rates based on largely subjective factors. Rates so produced may objectively be far too low or too high,

⁶ Carroll, L., "The Hunting of the Snark", London, Macmillan.

thus over-emphasising the cyclical effects of market capacity on rating large industrial and commercial risks.

The work that has been done in recent years on the application of the Theory of Risk to insurance is an encouraging move in the right direction, as are the techniques which have been suggested for an approach to rating making use of risk theory, notably for Allen & Duvall⁷. Such approaches have their practical limitations, in particular in dealing with the problem of the randomness of large loss, but they show that readiness to depart from "coffee-house" techniques which the pace of change demands.

Only by adapting its approach will the insurance industry be able to cover the really large or really difficult risk which advancing technology is making more and more common. O.I.L. has shown that such risks can be written, and the market response to the creation of O.I.L. has shown that, given the stimulus, the insurance market can itself write them. In this case, buyers have led the way. This is likely to be increasingly the case, as buyers adopt the techniques of risk management.

In managing their own risks, insurers have, in general, been extremely successful — sometimes too successful for the good of reinsurers. For them, risk management is very much management itself. But the future strength of insurance, which is indispensable as a financing technique for major risks, depends upon the encouragement given by insurers to constructive use of risk management by their insured. Coupled with this should be increased readiness to use risk management methods in assessing the impact that future change will have on their own business.

All, risk managers and insurers alike, will need a more scientific, more numerate approach, a readiness to learn from disciplines other than those traditionally consulted. "Tempores mutantur, nos et mutamur in illis". Risk management must accept that change, and devise techniques which do not assume a static world. To give Alvin Toffler the final word :

"By changing our relationship to the resources that surround us, by violently expanding the scope of change, and, most crucially, by accelerating its pace, we have broken inevitably with the past. We have cut ourselves off from the old ways of thinking, of feeling, of adapting. We have set the stage for a completely new society, and we are racing toward it... It is this that calls into question man's capacity for adaptation — how will he fare in this new society? Can he adapt to its imperatives? And if not, can he alter these imperatives?"⁸

In a phrase, can he manage the risk?

⁷ "Property Insurance Rating: A Plea for Change", Allen T.C. & Duvall R.M., New York, Journal of Commerce 1973.

⁸ Toffler, A., Op. Cit. p. 19.