

THE LOSS CONTROL APPROACH  
TO INDUSTRIAL SAFETY

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I, M. L. Will, submit this thesis for the degree of Master in Industrial Administration. I claim that this is my original work and that it has not been submitted in this or in a similar form for a degree at any University.

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## ABSTRACT

Because industrial accident rates in many industrialized countries are apparently worsening, efforts are being made to devise new accident prevention techniques. One recent development is Loss Control, which involves a new management approach in which safety is incorporated in an integrated cost reduction programme to reduce all types of non-speculative risks incurred by the business. Shifting the appeal away from the traditional goal of preventing injuries, Loss Control attempts to lower accident rates through improved measures to raise productivity, and thus protect the safety of employees indirectly, by making the business more efficient.

Since Loss Control emerged in the United States and Canada during the 1960's, it has been adopted by many firms in various countries throughout the world. Books and articles on the theory of Loss Control have challenged previous assumptions about the best ways to manage industrial safety, but unfortunately, no one has analyzed very carefully the advantages of the new approach over traditional methods, or published any detailed descriptions of specific firms to show how Loss Control has been implemented and what outcome it has actually had. The main objective here is to correct this deficiency, and evaluate Loss Control in both theory and practice.

An analysis of the industrial safety problem, including an examination of various optimistic views about the prospects for alleviating it, demonstrates the importance of the subject as a research topic. Moreover, by identifying and carefully considering the main features of the traditional approach to safety, one can indeed see many weaknesses, where existing methods do not accord with accepted principles of business management. The theoretical case for Loss Control is established by comparing its principles with those implicit in the traditional type of safety programme: the findings are that Loss Control does promise to be a more effective alternative, as, among other things, it is better designed to achieve active participation and support from top management and from line personnel generally, to obtain more complete information about possible accident causes, to monitor company and departmental performance, and to motivate people to work towards the desired goals.

To test Loss Control in practice, a survey was conducted among a representative sample of firms in the Western Cape which have tried to develop Loss Control systems. In five selected companies of different sizes and from various industries and geographical centres, a suitable respondent was questioned about the characteristics and the outcome of the firm's programme. The results were then assessed and compared with the theory. The survey confirms many of the alleged advantages of Loss Control, but also points to certain limitations which previous writers have failed to recognize. For example, indications are that Loss Control still fails to solve some basic problems stemming from the fact that higher management is seldom genuinely

interested in safety.

Besides containing some original findings about the Loss Control approach to safety, the investigation contributes to our knowledge of accident prevention by constituting what is probably the first extended study of the application of Loss Control to South African conditions.

## PREFACE

Industrial safety is not generally regarded as an urgent problem, either among the general public or among most people in business. There is a widespread assumption that accident rates are fairly low, and that continuous and satisfactory progress is being made in reducing them still further. Companies with safety programmes are generally content with their effectiveness.

In this thesis I shall argue that all of these views are wrong: industrial safety remains a serious problem; progress in alleviating it is disappointing; and most existing safety programmes are ill-conceived and less effective than they should be. Because this situation exists, there is a need to consider new approaches to accident prevention.

During the past ten or fifteen years, a new management approach to industrial safety has been developed, called Loss Control. Basically, Loss Control involves an integrated cost-reduction programme to reduce a wide range of losses, including those caused by accidents, fires, thefts, improper maintenance, labour turnover and absenteeism, and so on. Proponents of Loss Control argue that among its many benefits, it is more effective than previous methods in bringing accident rates down. The main aim of this thesis is to evaluate this claim in both theory and practice.

We shall begin by describing and analyzing the industrial safety problem, both historically and as it exists today in leading industrialized countries. Next, because in order to evaluate Loss Control it is necessary to understand the kind of system it is designed to replace, we shall look at the traditional injury prevention approach to industrial safety, and note some of its major weaknesses. We shall then turn to the theory of Loss Control, describe its application to safety, and point out how in theory it should be better than the previous methods.

The existing literature on Loss Control includes descriptions of various new techniques and some arguments in favour of using them, but unfortunately, there are no detailed studies of particular firms showing how the Loss Control approach has actually been implemented and what effects it has had.

Therefore, as a practical test of the theory, we shall conduct a survey of some firms in the Western Cape which have tried to apply Loss Control principles to safety, to see what they have done and how successful they have been. Besides serving as a test to decide whether Loss Control is more effective than traditional methods in reducing industrial accident rates, our findings will be intended to show: (a) whether the new approach is suited to South African conditions; (b) whether more South African firms should try to develop Loss Control programmes; and (c) if so, how they should go about it and what problems they should avoid.

## CHAPTER ONE

### BUSINESS MANAGEMENT AND THE PREVENTION OF ACCIDENTS

#### 1.1 THE PROBLEM : A CONFLICT OF INTEREST?

It is obvious that any business activity will expose employees to certain risks of accidental injury; and since the owners and the managers of a company are in a position to control factors such as the conditions, methods and rates of working, selection and training of employees, and so on, they therefore have considerable control over the types and the degree of risks to which workers are exposed. But a difficult question to answer is this: When is it good business management to try to reduce the risks of accidental injury? On his list of objectives for the business, would a good manager assign a high or a low priority to the task of lowering his firm's accident rate?

The challenge presented by Marx's analysis at the beginning of the Industrial Revolution has not been satisfactorily answered to the present day. For Marx, the shocking rise in the numbers of people killed and permanently disabled by industrial accidents, and also by the effects of overwork and poor hygienic conditions in factories was merely a symptom of the exploitation of workers under a capitalist economic system. Marx claimed that private ownership of the means of

production engenders a division between two classes of people: those who own and control the factories and the goods they produce, and those who work in the factories but are deprived of ownership and control.

The relationship between these two main classes, the capitalists and the workers, is contradictory or antagonistic, in the sense that what is to the benefit of one class will often, automatically, be to the detriment of the other; that is, there is an irreconcilable conflict of interests. For example, the capitalist will benefit by keeping wages as low as possible and by spending the minimum amount on improving working conditions for employees, in order to increase profits and thereby the amount of money he can expropriate for his own consumption or further investment. Dealing with the objection that the worker's plight would improve along with economic development, Marx wrote :

Even the most favourable situation for the working class, the most rapid possible growth of capital, however much it may improve the material existence of the worker, does not remove the antagonism between his interests and the bourgeois interests, those of the capitalist. Profit and wages remain as before in inverse proportion.<sup>(1)</sup>

Similarly, in several sections of Das Kapital, when discussing early attempts to pass legislation to force employers to provide safer and healthier working conditions in England and other countries, Marx made it clear that he believed that the

question of industrial safety involves the same conflict of interest: because of their economic positions, the owner and manager will tend to try to reduce accident rates only when they believe that doing so will directly or indirectly increase profits.

All of the important books and articles on the theory of industrial accident prevention can be regarded as implicit replies to Marx's very depressing picture of the prospect of bringing accident rates down.

First, until recently, most writers have been full of praise for the progress achieved since Marx's time to safeguard workers in highly industrialized capitalist societies. A typical remark is the following :

First, the question must be asked, "Has the safety movement, in fact, done anything in the past to prevent accidents? To that question can be answered a clear "Yes!"<sup>(2)</sup>

The answer to the question, "What has the safety movement accomplished?" is in purely positive terms -- accomplishments, advances, achievements.<sup>(3)</sup>

Such a claim, if it can be substantiated, would refute the prediction that is implicit in Marx's account, that economic class differences would hinder satisfactory progress in industrial safety.

Second, many writers have explicitly denied that there is a conflict of interest between owners and managers on the one side, and workers on the other. For example, it has often been argued that managers are strongly motivated by humanitarian, as opposed to economic, considerations to aid the worker :

Most managements have a sincere humanitarian interest in their employees and their families. For this reason, injuries are disturbing to them and they are generally glad to allocate money to accident-prevention work when there is the prospect of breaking even on the venture financially .... Some managements are willing to do even more and spend money on safety without expecting equivalent financial gain. (4)

In addition, many writers have claimed, contrary to Marx, that capitalists generally believe that what is good for the worker's safety will also be good for the business. For example, H W Heinrich, the author of the classic book on the subject of industrial accident prevention, offers only a brief explanation of how to get owners and managers interested in safety. He ends by saying :

Further exposition seems unnecessary for several reasons. One is that management in general is already interested. The expressed sentiment of many of the nation's highest business executives, Federal and State public officials, the national, state, and municipal chambers of commerce, trade and labor organizations, technical societies and representative individual persons, is that accident prevention definitely is good business. (5)

Finally, many writers have argued that the problem of safeguarding workers in capitalist societies has been solved to a significant extent by the enactment and enforcement of government legislation. While Marx was familiar with attempts to pass safety and health regulations in England, he was pessimistic about their outcome, as he saw the state as being essentially an organ for class oppression.<sup>(6)</sup> He admitted, of course, that the extension of voting rights would enable workers to ameliorate their position; but he predicted that legislative changes would be made only slowly and grudgingly by those in power. Contrary to this view, a number of writers since Marx's time have praised governments for their sincere efforts. After surveying "legislative progress" in the United States, Canada, England, and New Zealand, for instance, Bird and Loftus state :

No matter how one looks at it, it seems clear that governments of the world will continue to pass stronger and more expansive laws to give the worker greater assurance of safe and healthful working conditions.<sup>(7)</sup>

On the other hand, very recently, only within the past ten or fifteen years, a few important writers have begun to admit that satisfactory progress is not being made in reducing the risks of accidental injuries to industrial workers; and interestingly enough, they are blaming this lack of progress on owners and managers, and to a great extent also on governments. In their opinion, the situation calls for a

drastic change of approach.

While the purpose of this thesis is to assess one of these recommended "changes of approach", Loss Control, it will first be necessary to consider whether any change is required. To do so, we shall briefly examine the three main arguments against the Marxist prediction that the aims of business management will prove inimicable to the goal of reducing accidental injuries to workers: first, the claim that continued and satisfactory progress has been made in lowering industrial injury rates; second, the claim that most owners and managers are genuinely interested in their employees' welfare, and will support safety programmes even if they believe it is not financially profitable to do so; and third, the assertion that governments have made laudable attempts to protect workers by the enactment and enforcement of legislation.

#### 1.1.1 Has there been satisfactory progress?

Since Condorcet and the eighteenth century, people have been accustomed to believing that with the passing years, man makes continuous progress -- if not in every field, at least in the areas of science and technology. Ask one who is unfamiliar with the history of industrial safety to sketch what he would expect a graph of accidental injury rates for a country such as the United States, England, or South Africa to look like, if it were plotted over fifty years or so, and he will be very likely to draw a straight line or a slight curve depicting a fairly sharp and continuous downward trend.

At first sight, some of the data does seem to support the view that significant and satisfactory progress has been made.

In the United States for instance, from 1933 to 1972 the number of accidental work deaths per 100 000 workers declined from 37 to 16 (see fig. 1). Going back even earlier, according to the National Safety Council :

If the annual accidental death rate per thousand of population which held in 1912 had continued, there would have been over 1.5 million more accidental deaths than actually occurred. Since 1912, the death rate for persons of normal working age - 25 to 64 years - declined more than 67 percent while the rate of all ages of the entire population declined only half that much. (8)

Similar claims are made about the reduction of accident rates in South Africa. For example, from 1951 to 1973 the percentage of workers suffering disabling injuries in accidents at work declined from 4 percent to 2.3 percent. (9)

However, one must be careful in assuming that such improvements in the accident figures have been mainly caused by progress in the "safety movement;" that is, by the achievements of industrial safety officers, by more enlightened attitudes on the part of management, by an increase in "safety consciousness" among workers, and so on. In the first place, the decline in death rates and disabling injury rates is partly due to improvements in medical treatment, although it is impossible to assess the exact effect this has had. This point is granted, perhaps a bit reluctantly,

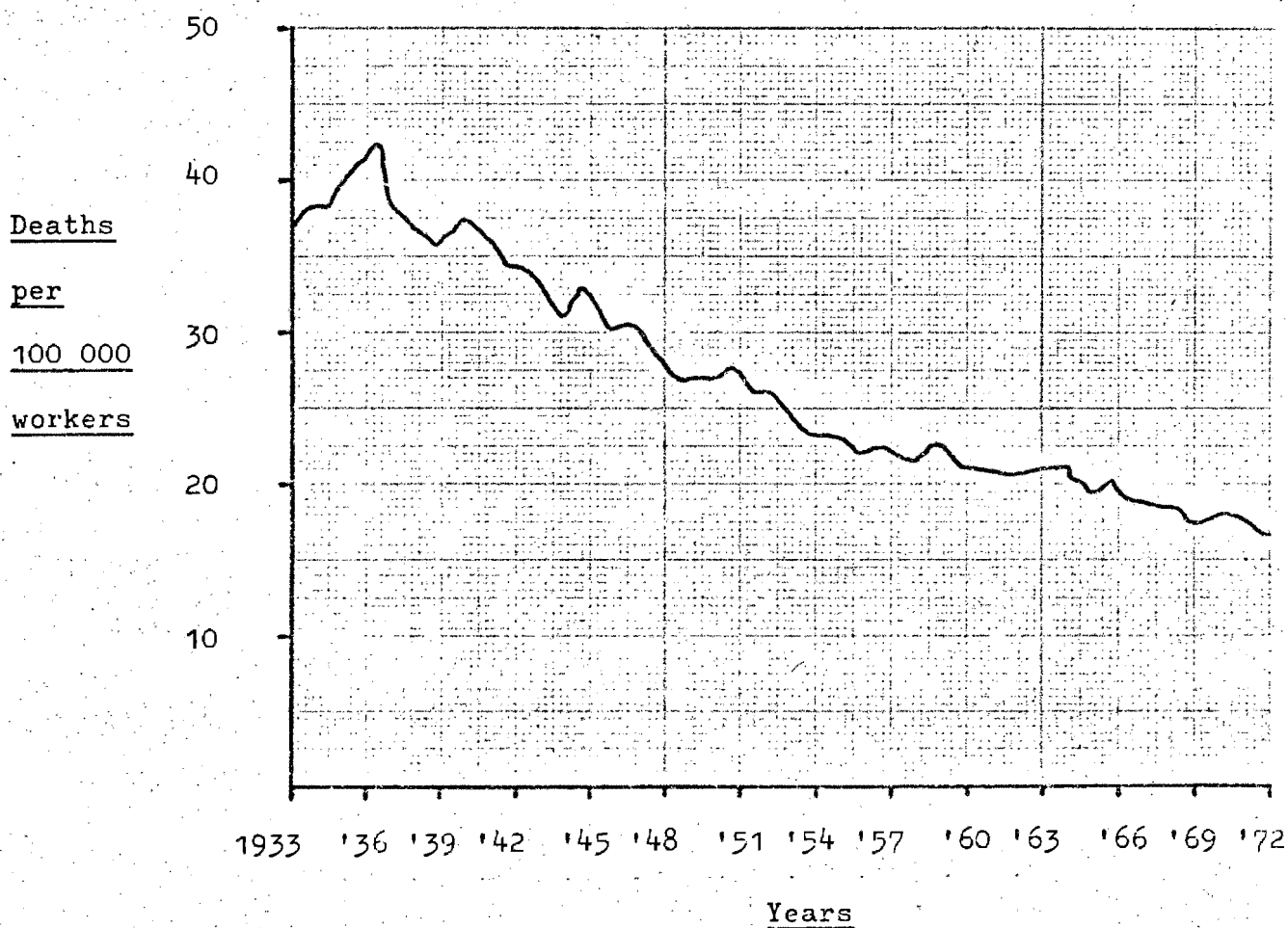
by the National Safety Council :

Medical progress accounts for some of this gain, but the larger part is certainly the product of organized safety work.<sup>(10)</sup>

But the claim about the large contribution of the safety movement is further weakened by another consideration which is never recognized in books on the history of industrial safety. Accident rates are calculated on the basis of the total manhours worked by all employees, regardless of their jobs or the degree of risk to which they are exposed. But the tremendous increase in automation in industry has dramatically lowered the percentage of workers who perform manual tasks where the risk of accidental injury is relatively high. In fact, there has been a massive shift in the working population from blue-collar to white-collar jobs, especially with the rapid development and growth in such areas as marketing, accounting, computer services, communication, research and development, and so on; and as records as well as common sense will tell us, white-collar workers are generally exposed to far lower risks of accidental injuries on the job. Given the way in which industry has changed, therefore, we could naturally expect accident rates to decrease, even if organized safety work had made no progress whatever. This does not mean, of course, that no progress has been made; but once other factors are recognized, the improvements in accident rates look far less impressive.

FIGURE 1

TREND OF ACCIDENTAL WORK DEATHS  
IN THE UNITED STATES

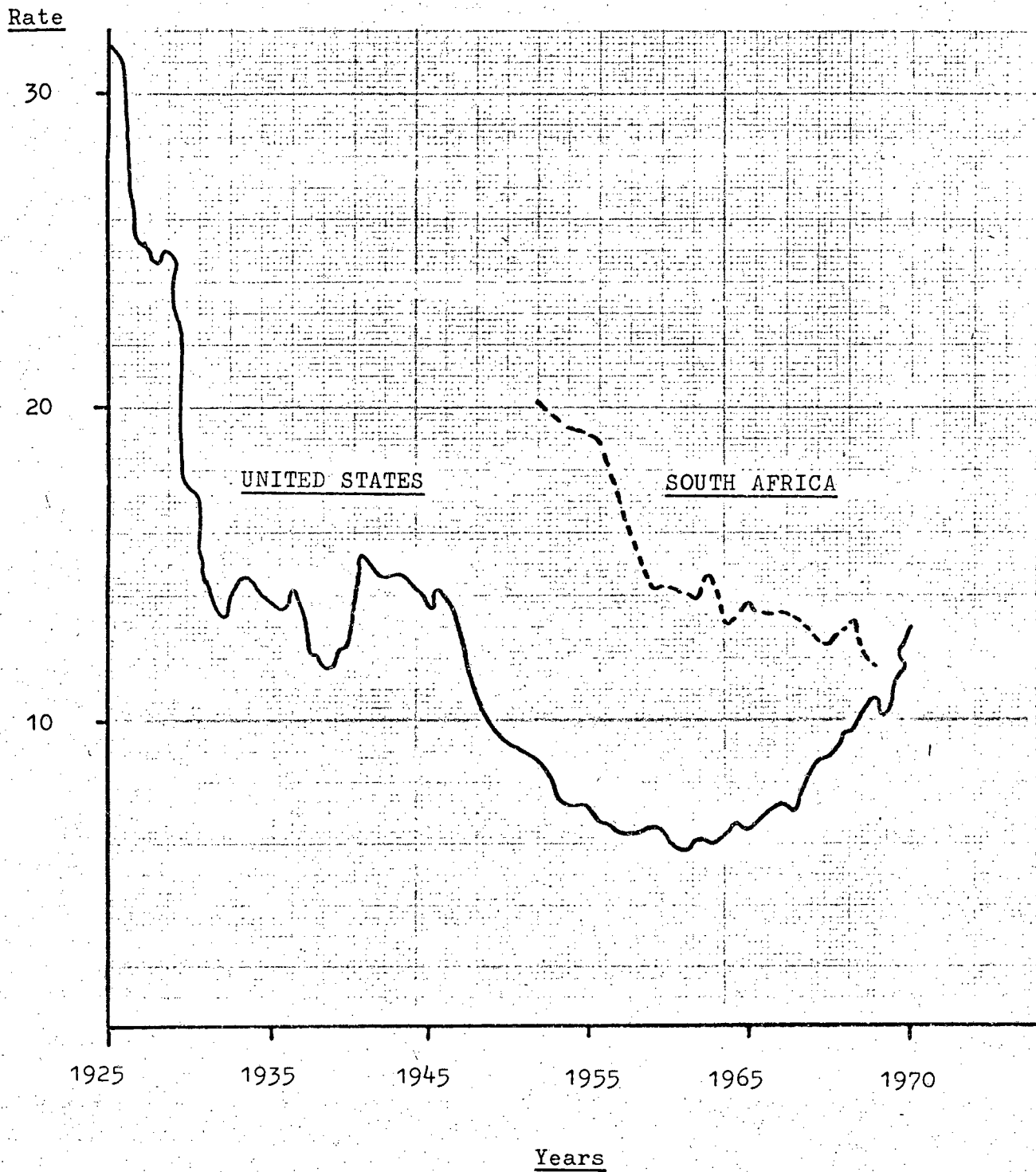


Moreover, if we focus our attention on some of the figures for the last fifteen or twenty years, the situation looks even less satisfactory. In their book Total Loss Control within the Industrial Environment, Fletcher and Douglas suggest that many accident rates are increasing. Citing statistics from the United States, they note that after World War II, when disabling injury frequency rates <sup>(11)</sup> went up by 10 percent, they then dropped by 50 percent in the next ten years. After 1955, however, the rates started to level off, and by 1960 began rising. Between 1960 and 1967, the injury frequency rates worsened by 20 percent. <sup>(12)</sup> In South Africa, statistics published by Workman's Compensation show that rates in this country have also tended to level off, but so far, have not exhibited any definite worsening trend (see fig. 2).

Again, however, caution is needed in drawing conclusions. Although we shall see in a later chapter various reasons why accident statistics can be particularly misleading, it is sufficient for the present context to note one important problem. Studies have shown that many industrial accidents, often ranging from 30 to 70 percent, go unreported; so a rise in the disabling injury frequency rate can easily reflect an improvement in reporting, rather than an actual increase in the frequency of accidental injuries. Fletcher and Douglas admit that other factors must be considered, but argue that they could not explain an increase as high as 20 percent. Supporting the conclusion that the situation really is deteriorating in some

FIGURE 2

DISABLING INJURY FREQUENCY RATES -  
UNITED STATES AND SOUTH AFRICA



countries, is the interesting fact that statistics from Canada, England, France, Germany, and Australia all show rises in frequency rates during the same period of time, from 1960 onwards. (13)

An optimist may try to rationalize the evidence and argue on the grounds of a law of diminishing returns that in spite of increased efforts, we should expect to reach a stage where accident rates will at least level off. This is undeniably true; but we should consider the level at which the levelling-off process has recently occurred. Looking at the American statistics, the average frequency rates for all industries show no signs of improving beyond the 1960 figure of about 7 disabling injuries per million manhours. In South Africa, the rates appear to be levelling off near the present United States figures of 11 to 12. While these are average rates for all industries, it is easy to find selected companies in industries carrying exceptionally high risks, such as construction and transport, which, by developing effective safety programmes, have managed to lower their own rates to well below 5. Therefore, although we would indeed expect frequency rates to level off at some stage, it appears that the recent levelling-off process has occurred at an unsatisfactorily high level.

In summary, it seems undeniable that more than a hundred and fifty years after the Industrial Revolution, the problem of protecting workers from occupational accidents and industrial

diseases is still a disturbing one. In America, for example :

The statistics are appalling ... Every year among our 75 000 000 employed civilians there are at least 336 000 cases of occupationally related diseases. In addition to disease, accidents on the job annually cause more than 14 200 deaths and 2 500 000 disabling injuries. (14)

In South Africa, Workmen's Compensation reports that yearly, out of  $4\frac{1}{2}$  million registered workers, 2 500 are killed and 355 000 suffer disabling injuries because of occupational accidents. According to the President of the Association of Scientific and Technical Societies, the cost of accidents to South African industry exceeds R300 million per year. (15)

#### 1.1.2 Management attitudes

In general, is there an overriding concern on the part of owners and managers to make profits, which is seriously hindering efforts to bring accident rates down? As we noticed earlier, many important writers on industrial safety have said no. Some have argued that managers often put humanitarian considerations above economic ones, and support safety programmes even when they realize it will raise costs and reduce profits. Others have argued that besides being strongly concerned for employees' welfare, most owners and managers feel that money spent on safety is "good business." Suppose we look at the evidence.

It is important to note that those who have defended management

attitudes do not cite any reliable opinion surveys as grounds for their claims; instead, they usually quote statements made by various corporate executives in addresses to safety conferences. For example, in its official manual, the National Safety Council quotes only one corporation president.<sup>(16)</sup>

Again, to support their assertion that "... Apart from humanitarian factors, enlightened management is more and more recognizing that 'safety is good business'," Simonds and Grimaldi quote the vice-president of General Motors, in an address given to the President's Conference on Industrial Safety.<sup>(17)</sup> And without giving specific examples, Heinrich reports that this is the "expressed sentiment" of "many of the nation's highest business executives."<sup>(18)</sup>

Obviously, however, what a few executives say to audiences at safety conferences cannot be accepted as reliable evidence about general management attitudes. In 1967, a survey was made to answer the question: To whom do top corporate executives feel most responsible -- to society, employees, stockholders, creditors, or customers? The presidents and controllers of 300 randomly selected companies in the United States were sent questionnaires, and asked to rank those five groups according to where they felt their responsibilities lay. For our purposes, if managers were strongly motivated by humanitarian factors, we could expect the replies to indicate that the executives felt a strong responsibility to their employees, and to society. However, the survey found that corporate executives felt overwhelmingly that their greatest

responsibility was to the stockholders, as the owners of the business. No other group was even a close second. Comparing the percentage of times the groups were ranked first, stockholders scored 84.2%, employees 11.3%, and society 2.4%.<sup>(19)</sup> The following reasons were quoted as representative of "the prevailing attitude of top executives."

Every business enterprise is formed with one basic objective - to make a profit. The fundamental economics of capitalism is the formation of capital with the objective of producing a profit for the owners ...

While acknowledging our considerable responsibilities to all other groups our prime responsibility is still to the owners ... Although the interests of the various groups occasionally conflict and the short-term resolution may appear to be inconsistent with stockholder interest, each decision is made with the long-term interest of the stockholder in mind.<sup>(20)</sup>

The objection might be made, of course, that with regard to accident prevention, top managers generally believe that the interests of employees and stockholders coincide -- that preventing accidents is usually good for profits. Here we must distinguish the question of whether safety is in fact good business, from the question of whether managers generally believe that it is. We shall deal with the former question in some detail in a later chapter, when examining one of the fundamental assumptions of Loss Control. In the present context, however, the relevant factor is what most managers believe. The strength of management's conviction that preventing accidents helps the business ought to be reflected in the priority given to the task

of reducing a firm's disabling injury frequency rate. A survey conducted by Bird and Loftus, however, suggests that managers tend to rank safety fairly low on a scale of business objectives. Out of a list of eleven items, cutting operation costs and increasing the production rate were regarded as most important, while reducing the accidental injury rate was ranked only seventh.<sup>(21)</sup> The accuracy of this survey is confirmed by experience: for instance, certainly the most commonly-heard complaint from workers' safety committees is that their recommendations are rejected by top management on the grounds of cost.

Finally, although we have been looking at evidence concerning the attitudes of top executives, it is clear that the same outlook extends down to middle management as well. To cite one example, Rensis Likert, when investigating the problem of making line supervisors more employee-centered in their thinking, found that when foremen were asked, "What is the most important part of your job?", 78% replied it was "pushing for production".<sup>(22)</sup> While more will be said in a later chapter about the attitudes of managers as well as of workers, it does appear that in general, management's primary concern is with profits and production, and not with efforts to provide safer working conditions for employees.

### 1.1.3 The role of the government

Before deciding whether the present problems of industrial safety are bad enough to require a change to a different type

of approach, such as Loss Control, we need to consider a third factor, the influence of government legislation.

The intended purpose of the laws passed to provide for the safety of workers can be described as twofold: first, to lower the rates of accidental injuries by encouraging those in industry who take steps to reduce risks, and by discouraging those who fail to do so; and second, to provide compensation for accident victims and their dependants. In most countries, including South Africa, governments aim at the first objective by enacting and enforcing Factories Act legislation, while both of the above purposes are served by the operation of Workmen's Compensation schemes.

Looking at the history of industrial safety, if we should ask whether governments have usually passed required regulations quickly when the need became known, and wholeheartedly enforced them once they were enacted, the answer would seem to be no. There are many examples, including very recent ones, which could be cited. In the United States, for instance, several state governments, influenced by businessmen who were disturbed by the cost of Workmen's Compensation insurance, declared Workmen's Compensation unconstitutional.<sup>(23)</sup> In the same country, as recently as 1970, investigations showed that only a few states had safety legislation and enforcement procedures that were "reasonable or adequate".<sup>(24)</sup> In England, one of the most shocking examples of governmental inaction concerns the hazard of asbestos dust. The British Government was aware

since 1910 that hundreds of industrial workers were dying yearly from asbestosis. Periodic reports from committees and research groups that emphasized the problem were ignored, and no serious efforts were made to enforce regulations against the interests of the powerful asbestos industry until 1964. Even today, government control of the problem is weak and halfhearted. (25)

As Lowrance puts it :

To the perennial question, "Under what conditions does the government step in and regulate?" we would answer, without meaning to be cynical, that government regulates whenever public pressure builds up to make it regulate. (26)

It should also be added that public pressure is usually slow to build up, because industrial safety and health problems receive little publicity.

But suppose we examine in more detail how effective safety and health legislation is once it is passed. On the subjects of the progress made in industrial safety and the problem of management attitudes, we have looked at reports from countries besides South Africa; since on those points South African conditions closely resemble those in England, the United States, and Canada. To avoid confusion, however, we shall now focus specifically on this country, although a few comparisons will be made with England, because of the similarity of English and South African industrial law.

First, the Workmen's Compensation scheme in South Africa is intended not only to provide compensation for the effects of accidents and industrial diseases, but also to influence firms by financial pressure to reduce their accident rates. Companies are forced to pay for "no-fault" insurance for their workmen: under the law, even when a worker is injured in an accident caused by his own negligence, he will be compensated, as long as the accident arose out of and in the course of his employment. In theory, then, because of Workmen's Compensation, the only way an employer can avoid paying for the costs of accidents is by preventing them. Additional financial influence is exerted by the method of setting assessment rates, by the rebate system, and by the provision of penalties in cases of negligence. The scheme penalizes firms with abnormally high yearly claims by raising the rates at which they must contribute to the insurance fund. Conversely, firms with abnormally low claims are rewarded with reduced assessment rates. In addition, after periods of three years, firms whose claims have formed a low percentage of the amounts they have contributed are also rewarded by having some of their contributions, as much as 50%, returned to them. Nearly R10 million was recently paid out to South African companies as merit rebates. Finally, in cases where a worker is injured in an accident caused by the negligence of his employer or one of his agents, the Workmen's Compensation Commissioner can force the firm to pay the victim or his dependants increased amounts, over the normal insurance benefits.

The scheme just described is designed to lower the industrial accident rate by appealing to managers on the basis of costs and rebates to invest in better safety programmes, and also, in an interesting way, by using the mechanism of free market competition. If firms A and B produce the same product, and A's factory is safe while B's is very unsafe, then B will probably be loaded with additional insurance costs from Workmen's Compensation, while A may be earning rebates. Then other factors being equal, A, with lower costs, can sell its product at a lower price and eventually force competitor B out of business.<sup>(27)</sup> If unsafe companies disappear from the scene and safe companies flourish, accident rates will go down.

How well does the system work in practice? One could easily mention many South African firms whose managements are definitely influenced by Workmen's Compensation costs, so to some extent the intended purpose is achieved. On the other hand, there are also many firms where managers are unaware of the rebate scheme and the possibility of getting assessment rates lowered. Also, many top executives are aware of the possible benefits, but regard them as insignificant in comparison with the benefits of increasing production, for example. A R10 000 rebate over a three-year period is not likely to make a strong impression on the manager of a company with a multi-million rand annual turnover.

Regarding the question of whether the financial rewards and penalties help to reduce accidents through the effects of market

pressures, one legal expert has recently expressed serious doubts. (28) First, since except in extreme cases assessment rates are shared equally among all the firms in the same industrial category, over a wide range, at least, the insurance costs of unsafe companies are partly financed by firms with lower claims. And second, among the wide variety of factors determining which firms fail and which stay in business, the effects of Workmen's Compensation costs are not likely to play an important role.

Finally, suppose we consider the provision for forcing companies to pay out increased compensation in cases of negligence. To determine how frequently this occurs, the present writer asked an official in the Workmen's Compensation office in Cape Town, who answered, "Only very rarely." The reason is that increased compensation is only considered when the accident victim or his dependants apply for it; and since very few people know of their rights under the compensation law, applications are seldom made. Government officials who investigate accidents or handle normal compensation claims do not advise victims to apply for additional benefits. Therefore, even in cases where workers are killed because of the gross negligence on the part of companies, the companies themselves are seldom required by law to pay out extra amounts of compensation. In South Africa, this problem is especially disturbing since accident victims who are covered by the Workmen's Compensation scheme do not have the right to sue their employers in court for breaches of the common law.

Turning now to the effectiveness of Factories Act regulations, we should again look at the matter in both theory and practice. One who reads textbooks on South African industrial law will be given the impression that owners and managers would be placed in a difficult legal position after most industrial accidents. For instance, the precedent established in the case of Naude vs. Transvaal Boot and Shoe Company dictates that when an accident occurs, there is a legal presumption that the person controlling the business has been guilty of negligence -- and the burden of proof is on the owner or manager to exculpate himself. Also, there is the principle of vicarious liability embodied in Section 40 of the Factories Act: whenever any subordinate has been guilty of breaking a regulation, the owner or manager is also guilty, unless he can satisfy some difficult criteria of establishing his innocence.

Unfortunately, however, the way in which the Factories Act is actually enforced makes the legal theory resemble a cruel joke played on the workman. As we shall see, the South African situation is exactly the same as the past English one described in a report by The Council for Science and Society :

(A Factories) inspectorate that cannot enforce its requirements must either confess its impotence or conceal it from view. In the latter, natural course, the inspectorate denies all cases of abuse except for the most flagrant: and in doing so becomes implicated in their continuation. Thus, a weak inspectorate is pushed towards identification with those who create the risks, to the detriment of those who experience them. Though the agents may be honorable men, and quite aware of their dilemma,

nonetheless they may be powerless to influence an inherently corrupt situation. Can such things occur? To a significant extent they may be said to have held for the old Factory Inspectorate ... Understaffing was but a symptom of its problems; more severe was the system that prevented it from having any real sanctions against offenders. In the last resort, an Inspector could take an offender to court. But this would only be before a local magistrate, and the local Inspector himself was required to prepare and argue the case against whatever talent the offenders could command. In any event, financial penalties were derisory, and the local bad publicity not crucial for the management in a national or international firm. So any threatened prosecutions were essentially (29) only a bluff, as factory managers were well aware.

In South Africa, Factories Act regulations relating to accident prevention are enforced by Inspectors of Machinery, employed in the Department of Labour. Their main duties are regular inspections of company premises, investigating serious accidents, and initiating legal proceedings against offenders, where necessary. Because of gross understaffing, the protection of workers by the system of regular inspections is inadequate, to say the least. It is not unusual for a factory to be visited only once in four or five years: a check of the Cape Town office showed that twelve Inspectors of Machinery are supposed to visit well over five thousand premises on a regular basis, leaving aside the time they must spend investigating accidents, preparing reports, holding official enquiries, and so on.

Inspectors learn by bitter experience not to rely on prosecution as an enforcement method, except as a last resort. In practice, long hours spent preparing evidence for a case are

usually wasted, since even when laws have been flagrantly violated an Attorney General will often decline to prosecute, or a Magistrate with no knowledge of industrial conditions will find the offenders innocent, or levy an absurdly small fine. Most inspectors speak about successful prosecutions they have obtained in much the same way in which golfers speak of making a hole-in-one. According to the inspectors in Cape Town, when they submit a report to the Attorney General recommending prosecution, he often declines, not because he disagrees about the parties being guilty, but because he feels that Factories Act cases are not worth the court's time. When a case does get to court, the odds are often heavily in favour of the accused. Without an adequate training in law, inspectors presenting evidence are at the mercy of skilled attorneys in cross-examination. If the decision hinges on evidence of a technical engineering nature, the magistrate is usually unable to understand it, and finds in the defendants' favour. In the rare instances where offenders are fined, the amounts are ludicrous. Again the situation is similar to that in the U.K.: a recent report there showed that while the law provided for a maximum fine of £2 400, the average amount imposed in 1976 was £87.<sup>(30)</sup> No average figure for South Africa is available, but a check of cases over the past four years indicates that the amount is probably even smaller. In a recent case where a man was killed because his employers failed to provide a safety harness as required by law, the two company directors were each fined R15, and the company itself R75.

In summary, then, one who assumes that the Government plays a

significant role in industrial accident prevention by enforcing Factories Act regulations needs to look at the facts more closely. The following statistics for 1976, taken from the files of the Inspectorate of Machinery in Cape Town, speak for themselves :

1.	Number of accidents investigated	3 625
2.	Cases in which prosecution was recommended	9
3.	Successful (offenders found guilty)	1
4.	Admission of guilt fines paid	2

#### 1.2 A NEW ATTEMPT TO RESOLVE THE CONFLICT : LOSS CONTROL

The main purpose of the foregoing discussion was to establish the importance of Loss Control as a research topic. As we have seen, the problems of protecting workers from industrial accidents are still severe, and in general the progress being made to resolve them is hardly impressive. Some leading authors are now arguing that until about 1960, industries were successful in lowering accident rates by applying simple, common-sense methods such as machine guarding, good housekeeping, safety training, and so forth; but that the levelling-off and even increase in the rates since then show the need for a new, more sophisticated approach. There are three main directions in which changes are now occurring. First, after years of neglect when very little scientific research on accident prevention was carried out, work is now being done, especially in the United States, in such fields as industrial psychology, ergonomics, and systems

design. Second, in a few countries, notably the United States and Britain, radical changes have been made in Government legislation and enforcement practices: more will be said about these in a later chapter. Finally, within certain companies there has been a switch to a new business management technique called Loss Control.

The most striking way in which Loss Control differs from traditional approaches to accident prevention is the departure it makes from the usual method of focussing on the causes and prevention of accidental injuries. Fletcher and Douglas, for example, cite the "narrow" interest in injury prevention as one of the major factors hindering further progress.<sup>(31)</sup> Instead, a Loss Control programme aims at reducing losses to the business over a wide range of areas, including not only accidental injuries, but also accidental damage, fire and security losses, problems of absenteeism, air and water pollution, product liability, and so on. In other words, to overcome the obstacles caused by the "conflict of interest" between managers and workers which we discussed before, the attempt is made to sell safety to management as part of an integrated package of cost reduction procedures. Advocates of Loss Control contend that this change will enable safety officers to prove to owners and managers that their programmes are worth considerable financial investment: that safety, as part of an entire Loss Control system, really is "good business."

In South Africa, managers have known about Loss Control since 1972. Although the movement has mainly developed in Canada, the United States and England, the leading authorities on Loss Control have come to South Africa and spoken at scores of meetings and seminars all over the country. The first was Jack Fletcher, a Canadian author and independent Loss Control consultant, who was here in 1972. Two years later the British authority Joe Shakespeare came to give a number of talks and seminars on the subject, followed the next year by Robert Loftus of Canada. From 1976 to 1978, the American Frank Bird, who is President of the International Loss Control Institute, visited South Africa several times to give a number of seminars and training courses in various geographical centres. In addition, NOSA, the South African safety organization supported by Workmen's Compensation, has conducted its own courses and seminars for hundreds of people in middle and upper management positions.

Given that South African companies know about Loss Control, however, to what extent have managers here accepted it, and how well has it worked where serious efforts have been made to put it into effect? While no detailed assessment of Loss Control in South Africa has yet been made, because of the seriousness of the industrial accident prevention problem the need for such a study seems to be a significant one.

We shall begin the investigation by considering some of the weaknesses in the traditional injury-prevention approach which

is still employed in most South African firms. Then we shall look at Loss Control in theory: whether it would be likely to remedy the defects of the traditional safety programme; whether it conforms with recent findings in fields such as Business Management, Motivation, and Organizational Behaviour; and whether it appears to have any inherent defects itself, especially if applied to South African conditions. Finally, we shall test the theory by gathering evidence from managers in a number of firms in various industries, who have tried Loss Control techniques as an alternative approach to accident prevention. Our results can hopefully be used as guidance by other firms who are using or planning to use the approach themselves.

## CHAPTER TWO

### THE TRADITIONAL "INJURY PREVENTION" APPROACH

#### 2.1 WHY EXISTING METHODS MUST BE EXAMINED FIRST

Before we can evaluate Loss Control in theory and practice, we need to understand why it is being proposed as an alternative to present methods of preventing industrial accidents. In the previous chapter we noted the disappointing progress made in major industrialized countries towards reducing accident rates, and the fact that some of the underlying problems of attitude and enforcement remain unresolved. While these considerations point to a need for change, taken alone they do not establish the necessity of changing to a radically different approach, as recommended by the advocates of Loss Control. In this chapter and the next, we shall analyze present industrial accident prevention methods to see if they exhibit significant weaknesses that are hindering progress, so that we can consider whether the Loss Control approach would be better.

Since industrial safety programmes vary tremendously from company to company, can one really generalize about one definite "approach" to accident prevention that has been used in the past? Simonds and Grimaldi, for instance, point out that among different types of industries and different sized

firms, there is great diversity with regard to the numbers and the qualifications of the people engaged in safety work, the position of the safety department in the organizational structure, the authority of the safety officer to enforce rules and stop dangerous operations, and so on. (32) Also, among different firms there are notable variations in safety training programmes, in the composition of safety committees, in motivational campaigns aimed at workers, and in other aspects of applying recognized accident prevention techniques. However, a comparison of a wide variety of industrial safety programmes reveals that they all share certain underlying assumptions about the nature of the problem being dealt with, and about the appropriate ways to attack it; and these basic assumptions tend to make safety programmes have in common, in spite of their many points of diversity, some general characteristics of organization and method.

One can, therefore, generalize about a traditional approach to industrial accident prevention. Following Fletcher and Douglas (33), we shall term this the traditional injury prevention approach, since, as we shall see, one of its distinguishing features is its focus on the prevention of accidental injuries. Without describing in detail any particular safety programme, we shall analyze the entire approach to uncover the basic features which make traditional injury prevention differ from Loss Control.

Although many books and articles have been written about safety management in modern industry, and a number include sections on the development of the safety movement since the Industrial Revolution, it is curious that no one seems to have recognized the importance of the connecting links between past and present; that is, to what extent our present thinking about industrial safety has been moulded by historical factors. The way in which the safety movement happened to develop in the leading industrialized countries strongly influenced our conception of the primary reasons for trying to reduce accident rates, and the proper steps to take towards doing so.

In Britain, following James Watt's invention of a workable steam engine in 1776, the new source of power began to be applied to industrial processes, especially in the textile industry. As factories employing power machinery began to replace cottage industry and small handicraft shops, accidental deaths and disabling injuries occurring to factory workers, many of them women and children, began to be a serious problem. Moreover, the rapid growth of British industry put heavy demands on coal mines to raise production for the supply of fuel: mine owners dug deeper pits with fewer safety precautions with the inevitable result: hundreds of miners were asphyxiated because of poor ventilation, crushed to death when shaft supports collapsed, and killed in explosions. The increase in imports of raw materials and exports of finished goods had a similar effect on

transport: disastrous train derailments and the sinking of steamships because of overloading became common.<sup>(34)</sup> Although in the early years of the nineteenth century some general legislation was passed to make working conditions safer, a government commission which surveyed textile mills in 1833 found that the legislation was "almost totally inoperative."<sup>(35)</sup> Consequently, Parliament passed a Factory Act in that year which appointed four Inspectors of Factories to enforce the law, and slowly, beginning in 1844, began to enact more specific safety and health regulations as public knowledge of accidents and appalling working conditions grew.

It is important to notice that these first feeble attempts to reduce industrial accident rates did not stem from humanitarian motives on the part of factory owners and Parliamentarians.

On the contrary, most of them resisted improvements.

Industrialists wrote letters to the press and speeches were made in Parliament arguing that Factory Act regulations constituted unjust government interference with free enterprise, and that protecting the workforce in such a paternalistic manner would gradually enervate and demoralize it, to the detriment of the nation. This resistance to safety measures was also exhibited in practice. For example, to prevent disasters caused by the overloading of ships, the Plimsoll line indicating maximum loads became compulsory in 1875; but since the wording on the requirement permitted owners to paint the line wherever they pleased, they often placed it on the ship's funnel, a practice

only ended by an amendment to the law fifteen years later. (36)

Fortunately for the workman, the extension of voting rights during this period enabled him to have some influence on legislators, and his voice, added to those of social reformers, clergymen, and the Press, aroused enough public indignation to have an effect.

In other countries, such as the United States and Canada, a similar process took place. In the face of sharply rising industrial accident rates in the late 1800's and early 1900's, pressure to improve working conditions and to provide compensation for injured employees originated mainly from social workers and labour organizations, not from employers. For example, a study of fatal industrial accidents in Pennsylvania in 1909 showed that over fifty percent of the surviving widows and children were left with no sources of income, and that only thirty percent of the payments made as compensation exceeded five hundred dollars. Since at that time there were over thirty thousand fatal industrial accidents occurring yearly in the U.S., when published in newspapers over the country the report aroused a great deal of public outcry. (37)

Looking at the history of the industrial safety movement, then, one can distinguish two significant facts: first, the movement originated mainly out of humanitarian interests, when the plight of accident victims and their families became known and public sympathy was aroused; and second, employers finally began taking

steps to prevent accidents by guarding machinery, providing protective equipment, and so on, not on their own initiative, but rather in response to outside pressure from factory inspectors, labour unions, government commissions of inquiry, the press, and various advisory bodies such as the National Safety Council. The former development helped to produce one of the fundamental assumptions underlying the injury prevention approach, while the latter largely determined the form which industrial safety programmes would take.

What is the problem and what is the proper way to solve it? Since the attention of early social reformers was drawn to the effects of industrial accidents on workers and their families, they tended to see the need for preventing accidents as a separate problem on its own, and one which would call for special remedies. A fundamental assumption, therefore, which is still operative today, was the following:

Assumption (1): The best way to prevent industrial accidents is to develop a special safety programme, in which attention will be directed to actual and potential injury cases to determine causes and devise remedial measures.

Today we are so accustomed to thinking of "accident prevention" as a special activity, and to thinking that industrial

safety officers and safety organizations have special functions, that the above assumption may appear so obvious to us that we find it difficult to imagine alternatives. This feeling is also engendered by the numerous books on industrial safety. Heinrich, for example, one of the early writers on the subject, defines "accident prevention" as :

"... an integrated program, a series of co-ordinated activities, directed to the control of unsafe personal performance and unsafe mechanical conditions, and based on certain knowledges (sic), attitudes, and abilities."<sup>(38)</sup>

But if historical factors had been different, the approach to accident prevention could easily have taken on a very different form. For example, high accident rates might have been regarded from the beginning as merely a symptom that would automatically disappear, if major efforts were directed towards designing more efficient machinery and work procedures, improving industrial training, increasing job satisfaction and decreasing boredom among workers, and so on. In that event, accident causes would not be attacked directly, but indirectly; and special safety programmes, and the job of the safety officer, would never have been created.

As an underlying principle of the traditional injury prevention approach, Assumption (1) gives rise to several distinguishing features relating to organization and method, which, until very recently, virtually all industrial safety programmes had in common.

We shall list them with only brief explanations, before describing them in more detail.

#### 2.2.1 Safety as a special responsibility

Since preventing accidents was regarded as different from, and possibly often in conflict with, the main objectives of a business, the task of improving safety in a plant was made the special responsibility of one person or group of persons. The tendency to make this type of appointment was also strongly influenced by the historical fact we noted earlier, that employers usually initiated safety programmes only in response to outside pressure. The individual assigned these special duties might perform them part-time, in conjunction with other tasks, or full-time; or the duties might be given to a safety committee.

#### 2.2.2 Safety as a special group of activities

The person or committee with the responsibility for accident prevention carries out special activities aimed at discovering causes of accidental injuries and taking remedial action.

For instance, a safety officer will receive reports of accidents from supervisors or from the first aid section, and he will also attempt to discover unsafe acts and unsafe conditions in a factory by conducting regular inspections. Once an actual or potential accident cause is isolated, he suggests a remedy and advises in its application.

### 2.2.3 Success measured by frequency and severity rates

The fact that the traditional type of safety programme is restricted primarily to efforts to reduce injury rates is clearly shown by the standard measurements used to evaluate success or failure: frequency rates and severity rates. The former show the frequency of disabling injuries per million employee manhours:

$$\text{Injury frequency rate} = \frac{\text{number of injuries} \times 1\,000\,000}{\text{total manhours worked}}$$

The latter show the severity of injuries (in terms of days lost from work) per million manhours:

$$\text{Injury severity rate} = \frac{\text{number of days lost} \times 1\,000\,000}{\text{total manhours worked}}$$

Safety officers or safety committees often display graphs showing yearly or even monthly trends in these two rates for particular departments and for the company as a whole.

As we shall notice in a later chapter, the Loss Control approach raises doubts about all three of these characteristics.

### 2.3 THE FORM OF PRESENT-DAY SAFETY PROGRAMMES: SOME OF THEIR COMMON FEATURES IN MORE DETAIL

By looking at the various components of a typical industrial

safety programme, we can see more clearly how the basic features just mentioned are found in practice.

First of all, under the injury prevention approach, the special duties of a safety officer or safety committee are treated as a staff function, not as a line function. Consider for instance the relationship between a safety officer and a production manager. There are no line relations, since neither is directly responsible to the other for the duties he performs; and neither must carry out orders given by the other. Instead, the safety officer occupies a staff position; that is to say, he is given responsibility only for the subject of safety, and acts as an adviser to line managers on issues falling under that heading. Officially, the safety officer enforces regulations, for instance, indirectly, through the line managers. (39)

The fact that accident prevention is treated as a staff rather than as a line function may be somewhat obscured in certain companies. First, the safety specialist or member of a safety committee may occupy a line position at the same time: in a few firms, the production manager acts as a part-time safety specialist. Second, a safety officer occasionally has the power to stop dangerous actions or mechanical processes and to enforce the use of protective equipment. While this might appear at first sight to be line authority, in reality the person who obeys the safety officer's directive is doing so under the authority of one of his own line supervisors, in whose place

the safety officer has been permitted to act. In certain firms, for example, the safety officer's "orders" are regarded as coming from the managing director.

The main activities which the safety officer or safety committee will perform under the injury prevention approach are the following :

### 2.3.1 Organizing

The safety specialist has to administer, and sometimes even design, the formal safety programme. For instance, he may decide on the number and composition of safety committees, and see that they meet at prescribed intervals. He will write or help to write a general safety policy for the firm, and specific safety regulations to be enforced. He will organize the purchase of necessary protective equipment, such as hard hats and respirators; and ensure that enough people in the plant have first aid qualifications, and the equipment needed to administer first aid when necessary.

### 2.3.2 Procuring and analyzing information

The safety specialist finds out about potential causes of accidents in several ways. He makes regular inspections in an attempt to see unsafe acts or conditions in the plant. He obtains written reports on accidents that have taken place from supervisors or first-aid personnel. He also investigates certain accidents himself, interviewing witnesses, taking photographs of the scene, and so on, for later analysis.

After gathering information about accident problems, the specialist tries to devise effective remedies.

### 2.3.3 Advising

The advice offered by the specialist in his staff capacity is of two types. He may give technical advice, such as how to fashion a guard for a particular machine, or what kind of gloves an operator should use to protect his hands from a caustic chemical. He also gives advice of a non-technical nature to higher management on progress being made and on financial matters: he typically reports trends in frequency and severity rates, submits figures on the costs of accidents, and advises on setting budgets for accident prevention for future periods.

### 2.3.4 Record keeping

This function includes calculating the different accident rates, and keeping special files for accident reports, minutes of safety committee meetings, and so on. In addition, a safety officer often handles the keeping and submitting of reports and records for Workmen's Compensation.

### 2.3.5 Training

Special safety training for workmen is usually given, either by the safety officer himself, or by someone employing the advice of the safety officer or safety committee on particular training requirements.

### 2.3.6 Motivation

The safety specialist is in charge of motivating employees to

work safely and help to prevent accidents. He does this partly through personal contacts, and partly by employing devices such as interdepartmental competitions, safety poster programmes, bonus suggestion schemes, and the like.

#### 2.4 A SECOND BASIC ASSUMPTION OF THE TRADITIONAL APPROACH

We have seen how the formation of a basic assumption about accident prevention was determined by historical factors, and how certain general characteristics shared by traditional injury prevention programmes all flow from that same basic conception. Indeed, two of the common features we mentioned, first, that the task of improving safety is made the special responsibility of a particular person or group, and second, that the task is treated as comprising a special set of activities, may be regarded as defining characteristics of the injury prevention approach. In other words, any company programme which did not have those basic features could not be called an injury prevention programme of the traditional sort. But there is a second fundamental conception about industrial safety, which, although it is not a defining feature, may still be seen to underlie and help to determine the form of virtually all previous safety programmes.

In attempting to ascertain the primary causes of industrial accidents, safety specialists began to divide causes into two main categories: unsafe acts and unsafe conditions. Heinrich, for instance, explains that in the 1920's a number of theorems

were developed, which state, inter alia, that "accidents are caused directly only by (a) the unsafe acts of persons or (b) exposure to unsafe mechanical conditions." (40) This distinction naturally led one to ask which of the two generally caused the greater number of accidents. For several reasons, which we shall examine in the next chapter, a much larger proportion of accidents, usually estimated at between eighty and ninety percent, seemed to be caused by unsafe acts.

A typical conclusion was the one which Heinrich reached after a study of seventy-five thousand cases taken from the files of industrial firms and insurance companies. Each case was considered to decide whether the accident resulted either entirely or at least primarily from an unsafe act or an unsafe condition: the finding was that acts were the major factors in eighty-eight percent of the accidents, while conditions were mainly responsible in only ten percent (the remaining two percent were classified as unpreventable and not assigned to either category). Other studies produced strikingly similar results: research done on Workmen's Compensation statistics in the United States, for instance, appeared to show that unsafe acts were the major cause in eighty-five percent of the cases, and unsafe conditions in fifteen percent. (41)

Although a few writers have questioned the validity of these conclusions, the claim that most industrial accidents are caused by the actions of the workers themselves has been tremendously influential. As Professor G.R.C. Atherley

puts it :

For a century and a half there has been emphasis on human error and the human element as a cause of accidents ...

The safety movement and especially the voluntary safety movement has also been greatly concerned with the human element. Much of the safety propaganda put out by the various safety organizations is aimed at human error. A great deal of the safety training which goes on in industry is aimed at attacking human error and the human element by changing attitudes and behaviour.<sup>(42)</sup>

In other words, another basic assumption underlying the traditional accident prevention approach is the following :

Assumption (2): Since most accidental injuries are caused primarily by unsafe acts of workers, major emphasis should be placed on training and motivating workers to be more "safety conscious."

Like Assumption (1), this idea has also been instrumental in determining the form that industrial safety programmes have taken; so that in spite of their great diversity on points of detail, most company programmes are alike when we look at general features relating to organization and method. The common characteristics which stem from Assumption (2) are as follows :

2.4.1 Reliance on various motivation devices aimed at workers

Most company safety programmes depend heavily on a variety of methods intended to make workers more "safety-conscious." For example, most safety officers display safety posters at strategic positions in the factory, and change them regularly: these posters show workers correct and incorrect work practices, and exhort them to be more careful. Interdepartmental competitions are held, in which trophies or prizes are awarded to the section with the lowest injury frequency rate, the best rating on housekeeping or general safety inspections, the greatest number of manhours worked without a disabling injury, and so on.

Individual employees in winning departments often receive free pens, wallets, key chains, and the like, inscribed with some message about safety. Other, more unusual, devices are also used to get attention: for instance, the Director of the British Safety Council mentions that in one firm, the manager of the department which scored worst in a housekeeping competition had to keep a live pig tied to his desk!<sup>(43)</sup>

When firms or departments reach some accident prevention goal, such as managing to work one million manhours without a disabling injury, managements often provide financial bonuses or give banquets to reward their employees. Workers are often asked to serve on safety committees or to contribute ideas to safety suggestion schemes, with the assumption that they will be better motivated if they are given more direct participation in the operation of the safety programme. As one can see from the above examples, safety specialists have traditionally felt that a major part of their job was trying to "sell" safety awareness.

to the worker, much as one might sell a product. The National Safety Council explains :

The techniques used in modern advertising and merchandising have much in common with those used to "sell" safety. Just as most products and services require steady and imaginative sales promotion, safety likewise requires constant and skillful promotion.<sup>(44)</sup>

#### 2.4.2 Special safety training for workers and supervisors

The belief that most accidents are caused by unsafe acts of the workers themselves will also lead one to place strong emphasis on training, to improve attitudes and skills. Although in skills training for new workers, safety tips are often incorporated in the syllabus, rather than treated as a separate subject, in most firms with injury prevention programmes experienced workers and supervisors are given special safety courses.

The National Safety Council argues that special courses are necessary, since accident prevention "is a specialized body of information accumulated over a period of many years."<sup>(45)</sup>

Their recommended safety course for supervisors, for instance, includes sections on the elements, causes, and effects of accidents, safety instruction and motivation, good housekeeping practices, machine guarding, fire prevention and protection, safety with hand tools, and so on.<sup>(46)</sup>

It is important to notice here that most safety training is aimed at employees on the levels of foreman or supervisor and below, and not higher management level. For example, in South Africa the National Occupational Safety Association gives safety courses on request

for industrial firms: from 1976 to 1979, out of approximately one hundred and eighty courses conducted in the Western Cape, only one was given to higher management personnel.

2.4.3 The role of upper management: supportive rather than active

Another corollary of the assumption that most accidents are largely attributable to the unsafe acts of the workers themselves is the idea that the person in immediate charge of the workmen, that is, the foreman or first-line supervisor, will be the "key man" in a safety programme :

From studies of accident causes, one fact stands out: the biggest part of the job of preventing accidents belongs to the foreman. Establishing work procedures, instructing workers to use safeguards, and supervising to see that they do so are foreman's responsibilities.<sup>(47)</sup>

This is not to say, of course, that higher management does not have a vital role: writers on accident prevention agree that the foreman cannot be effective without the support of the managers above him. But a distinction is usually made between the higher manager's job of initiating and supporting a safety programme, and the role of the first-line supervisor and the safety officer, which is the more active one of detecting and analyzing risks, selecting and applying remedies, and so on. This distinction is clearly made, for instance, in an article by T.O. Armstrong on Safety Organization :

A few musts should be considered before we discuss specific plans for safety organization:

1. Safety must have top management approval, sanction, and support.
2. Responsibility for safety must rest with the supervisory personnel. (48)

Heinrich argues on similar grounds that the foreman is the key man for preventing accidents :

Employees look to the foreman or supervisor as the representative of management. Their work is performed safely and efficiently, or unsafely and inefficiently directly as the result of the controls exercised by the supervisor. Employees in general do their work when, as, if, and how the supervisor gets them to do it. No more important figure exists in industry for the control of safety and efficiency in production, than the first-line supervisor. (49)

In its practical application, this means that in most firms, people in higher management positions, such as managing directors, factory managers, transport managers, and so on, participate in safety programmes by signing general policy statements, approving or rejecting proposed safety budgets, accepting safety awards on behalf of the firm and handing out prizes after internal safety competitions, and perhaps occasionally sitting in on safety committee meetings. But otherwise, most of the work on accident prevention is done at lower management level.

Having noted some of the general characteristics of the traditional injury prevention approach, we now need to assess how reasonable and how effective they are, in order to decide whether or not the traditional methods should be abandoned in favour of Loss Control.

## CHAPTER THREE

### SOME WEAKNESSES IN TRADITIONAL INJURY PREVENTION

#### 3.1 THE NEED FOR A CRITICAL INQUIRY

In spite of the fact that injury prevention techniques such as those described in the last chapter have been used for many years as a tool to bring accident rates down, in many industrialized countries these rates have recently tended to level off or even worsen, as we noted earlier. When asked for an explanation, industrialists often blame the situation on a diminishing amount of support: according to them, even when a firm organizes a safety programme, at some stage workers and managers generally become less and less enthusiastic about helping to implement it. And since as we saw in Chapter I, co-operation is not enforced to any significant extent by the Government, accident rates do not improve as much as they should.

Although there is certainly some truth in this claim, a few writers have begun to suggest that much of the fault lies with the tool itself, with the safety programme, and not just with the people who are failing to co-operate with its use. In this chapter we shall examine some important flaws in the injury prevention approach, concentrating on those which the Loss Control

approach is designed to avoid. We shall see that many of the features of the traditional type of safety programme are inconsistent with established principles of good business management. This does not mean, of course, that existing programmes of the sort we have described are always ineffective: many firms have employed them very successfully, especially when their accident rates were previously extremely high. However, it will be argued here that the traditional injury prevention approach has serious limitations built into it; so that compared with certain alternative methods, progress achieved with the old type of programme is unnecessarily difficult, and typically reaches a point of diminishing returns, where in fact there is still a large scope for improvement. By first understanding some of the problems which Loss Control has been claimed to overcome, we shall then be in a position to discuss in a later chapter whether, in theory, companies would be advised to switch from injury prevention to Loss Control. The theory will then be tested by obtaining evidence from some firms which have tried to do so.

### 3.2 THE TREATMENT OF SAFETY AS A SPECIAL FUNCTION

#### 3.2.1 The staff approach

We observed in the previous chapter that a fundamental assumption in industry has been that accident prevention is a special activity or set of activities, and is best handled by someone acting in a staff position, who receives and analyzes reports, conducts inspections, keeps accident records, organizes

motivational campaigns, and so on. Is this assumption a tenable one?

Suppose we consider some of the factors which justify the appointment of staff personnel, such as training officers, cost accountants, personnel officers, and the like, who are supposed to assist line personnel, such as production managers and transport managers. Staff appointments have become necessary because of the growing complexity of business, which calls for increasing specialisation of knowledge. Take for example the position of a production manager with regard to the training of his workers. In many industries, the importance of advanced skills training is so critical, that it is felt that the job of training new workers cannot be handled well enough by the production manager or by the foremen under him, but requires a specialist, who is highly qualified in the specific areas of education and industrial psychology, and can use the latest teaching methods, equipment, and measuring techniques to achieve better results. In practice, a decision to appoint a training officer in a staff position to assist the production manager and foremen would only be taken if at least the three following criteria were satisfied :

- (a) That the task of adequately training workers demanded specialized knowledge which the line managers did not possess and could not be expected to acquire;
- (b) That the staff person appointed to do training had

far higher qualifications in the special field and could perform the function better than the line personnel;

(c) That the activities of the staff person supported those of the line managers, without duplicating them to any great degree.

Are similar criteria satisfied in the case of appointing a safety specialist? The key point in realizing that they are not is that there is no logical distinction between the causes of accidents and the possible causes of inefficiency in production, or in any other area of the business: the former are simply a subset of the latter. Consider for example the responsibility of the production manager, engineer, and foreman, which is generally to meet production quotas with maximum efficiency. Suppose accidents are occurring in a production department because of dirty and untidy floors, poor stacking of material, inadequately guarded machines, and the wrong use of hand tools. Correcting these faults is undoubtedly part of the line managers' responsibility to maximize efficiency. Identifying them and devising remedial measures do not require specialized knowledge which the line managers do not have, or at least would not be expected to acquire.

3.2.1.1 The question of specialized knowledge The objection might be raised here that the problems chosen as illustrations are too simple: surely the prevention of many types of accidents

does demand highly specialized knowledge. This is obviously the case; but the necessary information will almost always be in the possession of a line manager, or at least he will be in the best position to find it out. Suppose the problem were the difficult one of designing a guard for a press brake employed in a wide range of operations. The person best qualified to solve it should be a production engineer or supervisor having special experience with power presses in industry; and in any event, this would automatically fall under the line responsibility of controlling production. In fact, the observation that accident prevention often requires specialized knowledge is a stronger argument against the appointment of a staff safety specialist than it is for it, since no one person would ever have the wide range of technical knowledge and experience to deal with the variety of problems arising in all the various departments of a plant. As we are going to see later in more detail, the methods of "accident prevention" are not clearly defined and limited in scope, like those of cost accounting or training. Instead, they extend to virtually all of the ways of controlling every operation in industry. Thus, the appointment of a safety specialist does not satisfy the first type of criterion we mentioned for making staff appointments.

3.2.1.2 The question of higher qualifications Looking at the second item, are safety officers, for example, far better qualified than line personnel to perform the duties usually assigned to them? With respect to educational qualifications, the situation in some countries has begun to change. In the

United States, for instance, safety advisers now occasionally have university degrees in industrial safety up to Ph.D. level. In South Africa, however, no degree courses are yet offered at any university: the highest specialized qualification is the National Diploma in Safety Management. In practice, the overwhelming majority of safety officers in South Africa have very low educational qualifications: it is doubtful whether any such person in the entire country has a university degree; and fewer than fifty people even possess the National Diploma. A check of the records of the Chartered Institute of Industrial Safety Engineers reveals that many practicing safety officers have not completed Standard 10.

Moreover, let us consider whether the staff safety specialist is in a better position than the line manager to perform some of the main activities traditionally regarded as staff responsibilities. First, the safety specialist conducts inspections to detect unsafe acts and unsafe conditions. But as an outsider, he is seldom as well qualified as the line personnel in the department itself, either to notice or to assess them. The reason is that he is almost certainly less familiar with the machinery, the operations, and the work force. A simple illustration is the judging of good housekeeping competitions, a common practice in firms with safety programmes. Unless he actually works in a particular department on a day-to-day basis, a safety specialist cannot judge as well as the manager of that department whether or not raw material and spare

parts are superfluous, and should be removed; whether the storage of material is well suited to demand and to work flow; what type of schedule for cleaning will least interfere with production; and so on. Line managers very often reject the outcome of such competitions because they feel, rightly, that as a poorly-qualified outsider the safety officer is not a good judge. Of course, familiarity with conditions and preoccupation with other responsibilities can also blind the line manager to hazards in his own department. But an easier remedy to this problem is to have inspections carried out by inspection teams composed of qualified line managers from both inside and outside the department concerned.

Another major duty of the staff safety specialist is the investigation of accidents. Obviously, the same point about qualifications will apply here as well: in most cases, the person to investigate an accident ought to be the one most familiar with the operations, machinery and work force in the section where the accident occurred. While there are admittedly special techniques of investigation, such as how to interview witnesses, how to photograph an accident scene, how to keep informative records of an inquiry, and so on, these are easily available and quickly learnt by the line manager. (50)

If any additional specialized knowledge is required in areas such as mechanical or electrical engineering, or industrial psychology, the responsibility for accident investigation can again be given to a team composed of a foreman, department head,

engineer, and personnel officer, for example.

The traditional argument for having accidents investigated by someone in a staff position, from outside the department concerned, is that he is likely to be more objective, less influenced by personal considerations. But again, where the seriousness of the case merits it, this problem is easily overcome by proper selection of the inspection team.

Third, should a safety officer or safety committee organize special safety training for workers and supervisors? In most South African companies workers are hired, given formal skills training and on-the-job training if necessary, then sometime afterwards are sent on a safety course conducted by someone within the firm, or by another organization such as the National Occupational Safety Association. The question arises, however, why should safety training be treated separately? After all, learning to do any job properly involves learning how to do it safely, whether the job is painting, using a lathe, operating a crane, or whatever. And the person best qualified to teach someone the best way to do a job is not likely to be a staff safety specialist, but rather a highly qualified and experienced line manager, perhaps assisted by the training department. The practice of teaching safety as a special topic, usually as if it were an afterthought, almost invariably gives the worker the impression that it is not important, or at any rate is not what he is being paid for. Thus, in many firms the lack of safety consciousness among the work force is partly attributable to the

practice of regarding accident prevention as a special topic, and segregating safety training from training of other types.

Other traditional tasks of the staff safety specialist, such as record-keeping and motivation, will be discussed later in this chapter under separate headings. But we have already noticed with respect to some of the primary tasks that it is usually wrong to assume that a staff specialist will be better qualified to perform them than the line personnel: Therefore, the second type of criterion for making staff appointments is usually not satisfied.

### 3.2.1.3 The question of support rather than duplication of function

Finally, the reasons given so far for doubting the wisdom of treating safety as a staff responsibility are closely related to our third criterion, which said that the duties of staff should support but not largely duplicate those of the line. A good production foreman, for example, charged with meeting production quotas at maximum efficiency, will himself conduct regular inspections to try to locate problems before they develop further. He will also investigate any type of incident which seriously lowers efficiency, such as machine breakdowns, personal quarrels between workers, raw material shortages, production bottlenecks, unexplained absenteeism, and of course accidents. What about keeping records of numbers and costs of accidents? Line managers should already be keeping a tight control over various labour and material costs and overheads in relation to budget figures. The costs incurred because of accidents will

be included in his operating costs, although not distinguished as such; but if accident costs are significantly high, the line manager will try to determine the magnitude of the problem and to reduce it. Finally, the task of training and motivating workers to do their jobs safely is part of the task of training and motivating them to work efficiently, which is already one of the main responsibilities of the line manager. To a great extent, therefore, most of the traditional duties of a safety specialist simply duplicate, sometimes with different labels, some of the duties of line personnel, making it doubtful whether the staff appointment is then justified.

3.2.1.4 Two possible misunderstandings The objection might be made at this stage that the arguments presented above are simply reiterations of the point made by Heinrich and by other advocates of the injury prevention approach that "the foreman is the key man in industrial safety." This interpretation would be a mistake. Heinrich, for instance, supported the appointment of full-time or part-time safety officers and special safety committees to inspect, investigate accidents, and so on, but said that the co-operation of line supervisors was essential for the success of a safety programme. In contrast, the conclusion which follows from our own arguments is that accident prevention should not be made a staff function at all: it should be a line function. Dan Petersen has recently expressed the alternative very clearly. According to him, one of the fundamental principles of the Loss Control approach is

that "Safety should be managed like any other company function" :

Inherent in this principle is the fact that safety is and must be a line function. As management directs the effort by goal setting, planning, organizing, and controlling, it assigns responsibility to line managers and grants them authority to accomplish results. (51)

Another writer who agrees with this conclusion is N.T. Freeman.

After asking who is mainly responsible for safety in industry, he states :

A typical response may be 'This is the safety officer's responsibility.' In many companies this outdated concept still persists. In fact, it is no more the safety officer's responsibility to achieve safe working than it is the accountant's responsibility to ensure that a supervisor keeps his costs right in day-to-day operation, or that the purchasing officer ensures that he makes the most effective use of the materials he has purchased on the supervisor's behalf. (52)

A second misinterpretation of our criticism of this aspect of the injury prevention approach is to think that the arguments imply that the job of safety officer should disappear. One should note that we are only claiming that most of the specific activities that are carried out solely or primarily by a staff specialist under the traditional type of safety programme should instead be done by line personnel. It may still be necessary to appoint a safety officer, especially in very large firms, but his duties should be very different than they were previously. We shall discuss what his function would

be under a Loss Control approach in Chapter IV.

3.2.1.5 Practical problems of the staff approach Aside from the general arguments against the safety specialist's usual role in an injury prevention programme, what problems does this usually cause in practice? The conflict between line and staff in organizations is well documented in writings on business management, although apparently no one has yet focussed attention on the safety officer. Between him and the line, the friction which arises in most firms is in some respects like, and in others unlike, the classical staff-line dissension.

First, with many staff jobs, conflict often arises because the staff are generally younger and have higher educational qualifications than line managers. Consequently, line managers regard staff as clever, but lacking practical experience; while they are seen by staff as uneducated and resistant to change.<sup>(53)</sup>

With safety officers, these roles are usually reversed, but produce the same kind of friction. Since safety officers tend to be older and less qualified than line managers, the latter often ignore their advice, feeling that safety officers are ignorant and unprogressive.

Second, a common source of staff-line conflict is the fact that staff can give advice without being ultimately accountable for the decisions taken: as a result, line managers tend to be wary of accepting advice, while staff conclude that they are merely being stubborn.<sup>(54)</sup> In contrast, the safety officer

is usually accountable for results: his success in the job is often measured by the firm's frequency rate. But instead of improving his relations with the line, this usually creates other problems. Typically, in the eyes of line managers, they are in a "no-win" situation: if the frequency rate fails to improve, or the firm fails to win safety awards, the blame is placed on them for failing to co-operate; when things go well, the safety officer claims most of the credit for himself. The line manager's response to the resulting frustration is often to abdicate his responsibility entirely: when any question about safety arises, his reply is "that's the safety officer's job."

Another reason for the friction between the safety specialist and the line is that the scope and source of his authority are seldom made clear. We noted in the previous chapter that a safety officer can often order workers to wear protective equipment, and occasionally can even stop dangerous operations in the factory. In theory, his authority actually comes from the line, sometimes from the managing director. But since, as we saw earlier, the safety officer's responsibilities are mainly duplicates of some of the line functions, any attempts to give orders will be regarded by line managers as encroachment on their territory. We can understand the problem best if we imagine a person in another type of staff position trying to assume a similar role. For instance, suppose an accountant were to enter a workshop, approach an artisan, and tell him that his working methods were undesirable from the standpoint of cost

effectiveness.<sup>(55)</sup> The workshop foreman would be outraged at the accountant's interference; and yet many firms expect a safety officer to function in a similar way, without arousing resistance. This problem, of course, exemplifies the typical line complaint that the staff specialist tries to usurp line authority.<sup>(56)</sup>

Finally, a common source of line-staff conflict which also applies in the case of the safety officer is the fact that the staff person tends to overestimate the importance of his own speciality, instead of viewing it in the context of the overall interests of the business. Line managers often complain that safety officers, perhaps attempting to enhance the apparent importance of their positions, become fanatical about accident prevention: they grossly overestimate hazards they see in the plant; they are upset over injuries that are trivial; they fail to see why production should not stop for the sake of investigating a minor accident. In most companies with a full-time safety officer, it is fair to say that even when he is popular with the line on a purely social level, his activities in the firm are resented.

In summary, therefore, the traditional function of the safety officer or safety committee is not only difficult to justify on general grounds, it also adds to line-staff conflict within the organization.

### 3.2.2 The reporting of accidents

We noticed in the last chapter that because the safety movement originated from humanitarian interests in reducing injury rates, accident prevention was regarded as a special activity, where attention is given to actual and potential injury cases to determine causes and devise remedial measures. In most books on occupational safety, the very definition of the word "accident" is logically tied, either explicitly or implicitly, to the notion of personal injury. According to Simonds and Grimaldi, for instance, for the purposes of accident prevention the term "work accident" may be defined as :

... an unintended occurrence arising out of employment in any kind of business and industry that either causes personal injury or causes property damage or interference with production or other business activity under such circumstances that personal injury might have resulted. This definition, it might be noted, requires first the element of personal danger. (57)

They then add :

It is, of course, good management to attempt to prevent spoiled work or unnecessary deterioration of buildings and equipment. It is ordinarily only when an element of personal danger is involved, however, that the safety worker's responsibilities are concerned. (58)

This preoccupation with actual and potential injury cases engenders a certain practice of reporting incidents. In many South African firms, accidents are only reported and investigated where the victims' injuries are bad enough to require Workmen's Compensation claims; that is, where a person receives a doctor's

attention or is absent from his job for more than three days. Other firms require all accidental injuries to be reported, even minor ones. In a small minority of companies, employees are asked to report in addition accidents or near-accidents in which no one was actually hurt, if it seemed an injury might result if the same type of incident recurred.

Writers on Loss Control have recently criticized these practices as being far too limited. For example, Fletcher and Douglas argue that one of the main reasons why the results achieved with the traditional approach have been disappointing, is its "narrow base of action": "Progress has been hampered by channel vision, evidenced in the general preoccupation to prevent injury."<sup>(59)</sup>

The key point to recognize is that the distinction between events where discernable personal danger is present, and events where it is not, does not extend to root causes. For example, Simonds and Grimaldi claim that unless there were a proved degree of danger, "such unplanned occurrences as a lathe operator's inadvertently cutting a part too small, or a crack appearing in the concrete floor," would fall outside the safety specialist's concern, and would not be reported to him as accidents.<sup>(60)</sup>

But the underlying causes of the lathe operator (a) cutting a part too small, and (b) doing something dangerous, such as standing too close and having his clothing caught by the machine, are likely to be the same: inadequate training, momentary

inattention resulting from fatigue or boredom, and so on.

Problems of this kind ought to be identified and solved whether or not they have given rise to dangerous occurrences.

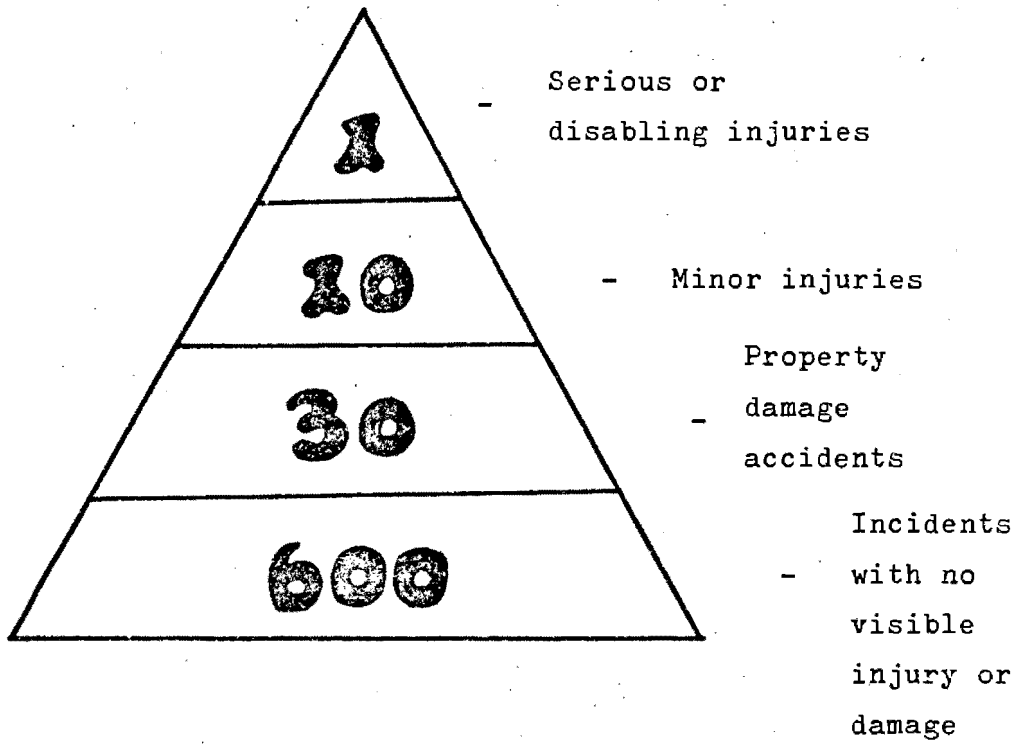
Consequently, why should one event be reported and the other not be; or why should they be reported to different people, or in different ways? The usual reporting practice is absurd: if a crack appears in the concrete floor, why report it to the maintenance department if it does not appear dangerous, but to the safety department (usually on a different form) if it does?

The foolishness of having a safety specialist restricting his attention to actual and potential injury cases is demonstrated by a study conducted by Frank Bird. An analysis was made of over one and a half million accidents reported in nearly three hundred companies covering a wide range of industries. The results showed that for every reported serious or disabling injury, there were also reported about ten minor injuries, thirty property damage accidents where no one was hurt, and six hundred accidents or near accidents with no visible injury or damage (see fig. 3).<sup>(61)</sup>

Of course, these figures cover reported cases: Bird also claims that in most firms, the majority of accidents are never reported.<sup>(62)</sup> We can explain the lesson to be learned from these ratios in the following way. Suppose in a given firm during a certain period of time there occur a total of 1282 incidents of the four different types. Applying Bird's ratios and assuming 50 per cent reporting in the firm where only serious and disabling injuries are reported, the safety officer or safety

FIGURE 3

ACCIDENT RATIO STUDY



committee will be receiving information representing only 1/1282 of the undesirable incidents that occurred. In the company where all injuries are reported, the sample is only slightly better, 11/1282. Obviously, where employees reported all dangerous occurrences, whether or not anyone was actually injured, the scope of information would be improved. But it would be better still to take the final step, and discard the restriction relating to personal injuries: as we shall see in Chapter IV, advocates of Loss Control argue that any incident that could cause serious inefficiency (which includes personal injuries) should be reported and analyzed. As we have just noticed, however, in firms employing the injury prevention approach, progress is hindered by the reporting policy: a safety officer is expected to make significant improvements in the accident rate, in spite of receiving only a restricted sample of information on the underlying causes.

### 3.2.3 A further demonstration of the weaknesses in the traditional approach

Against the arguments we have presented so far, proponents of the injury prevention programme with its staff safety specialist often point to the progress achieved with this approach. For example, some writers quote statistics to show that firms employing a full-time safety officer have lower frequency rates than firms that do not. According to Simonds and Grimaldi, one study of eleven Michigan foundries showed that plants with a full-time safety specialist had an average frequency rate of 3.3, while the

average for the others was 34. Another survey of eight motorcar manufacturers showed that four firms without full-time safety officers had an average rate of 15.7, compared with an average of 1.9 for those where at least one such person was employed. (63)

But these figures do not, as Simonds and Grimaldi suggest, prove the importance of the full-time safety specialist in lowering accident rates. Aside from the fact that the samples are too small to be used in drawing reliable conclusions, the argument itself is an example of the logical fallacy known as post hoc ergo propter hoc. That is to say, the fact that firms with full-time safety officers have lower frequency rates does not constitute evidence that lower rates were achieved because of those persons' activities. In practice, safety officers are employed in firms where line personnel, especially those at higher management levels, are interested in accident prevention. This interest alone is highly conducive to success, regardless of whether the safety specialist is effective or ineffective. Often the mere fact that such a person has been appointed demonstrates to employees that top management expects accidents to decrease, and as a result they do.

Defenders of the traditional injury prevention approach should consider this question: If this approach is so efficacious, why is it not used for other company functions, such as production? Suppose we imagine the possibility. The sales department of a widget manufacturer notifies the production manager that ten

thousand widgets should be produced in the next six months. To ensure that this is done, the managing director decides to appoint a person in a special staff position to take over from the production manager the responsibility of seeing that production quotas are met. The staff specialist, who has lower qualifications than the production manager and some of the production foremen, inspects the various departments periodically to check on progress, investigates production problems and makes recommendations to the line managers, and reports to top management. Reports on production problems from foremen and supervisors now go to the staff specialist, not directly to the production manager. In addition, the new staff specialist institutes a special motivational campaign for production workers. He hangs posters on the walls exhorting them to work harder and meet quotas; he shows them films during lunchtime with the same message; he starts a competition in which as prizes workers can win pens and keyrings for high production figures. Probably no industrialist would say that this approach even deserves serious consideration as a possible production management technique. But then it is not clear why we should expect it to be highly effective when applied to safety. Obviously, our own illustration here reflects back to Dan Petersen's principle that safety should be managed like any other company function.

### 3.3 MEASURING RESULTS

#### 3.3.1 Frequency rates and severity rates

Under the traditional injury prevention approach the usual

method of measuring success or failure is with injury frequency rates and severity rates. According to the National Safety Council :

These standardized rates, which are easy to compute and to understand, have been accepted generally as uniform procedure in industry and permit the necessary and desired comparisons. (64)

A graph showing company rates over a number of years will supposedly show whether the firm's safety performance is improving or deteriorating; and a comparison of the firm's rates with those of other, similar firms, or with industry averages, will supposedly show its general rank with regard to safety.

However, many writers on safety and Loss Control have been sceptical about the use of these and similar rates as measuring devices. One problem is that they are not statistically reliable. Consider first the matter of determining exposure. Ideally, injury rates would show the frequency or severity of accidental injuries occurring in a standard time during which workers were exposed to risks. But since it is seldom practical to obtain actual exposure time, rates are calculated using total hours of paid employment, a figure generally derived from the company hours and wages records. In South Africa, for instance, for the purpose of awards and competitions the National Occupational Safety Association follows the National Safety Council policy and accepts as the figure for manhours worked the total hours for all employees, including office staff. This

has the obvious disadvantage of favouring firms with higher proportions of white-collar workers, whose risk exposure is low. In an attempt to reduce the degree of error, the official statistics compiled by the South African Workmen's Compensation Commissioner include frequency and severity rates computed by obtaining a sample of hours worked by non-office staff in a few industries, and extrapolating to the others.<sup>(65)</sup> But this merely trades one source of unreliability for another. As the Commissioner himself admits,

(The frequency rate) has been calculated for a sample as explained and no claim is made as to accuracy as the sample was small and not very representative.<sup>(66)</sup>

One difficulty is that in order to be statistically reliable, the figures used in calculating rates must all apply to the same population; that is, to the group of people exposed to the risk we wish to measure. However, the manhours figure is either accurate, but applies to a wider population (the entire workforce), or is inaccurate, being obtained by guessing approximately what the hours for the relevant population would be. In addition, even if this guess were a good one, or the number of actual working hours for non-office staff were available, there is still a clear discrepancy between paid working hours and exposure hours, the magnitude of which will vary over time and from firm to firm, making frequency and severity rates unreliable for purposes of comparison. In the words of a statistician :

(The) blue-collar/white-collar problem is only an example, of course, of a whole class of problems that exist whenever the accident statistics are collected separately from the exposure statistics. The problem is that in such cases the accident counts and the exposure data will never "match" perfectly -- that is, will never refer to exactly the same population. (67)

Other major difficulties arise over the figures used for the number of disabling injuries (in calculating frequency rates), and the number of days charged (for severity rates). For the former, according to the National Safety Council, an accidental injury is only counted in the case of death, permanent disability, or temporary disability where the person cannot "perform effectively throughout a full shift the essential functions of a regularly established job which is open and available to him." (68)

In South Africa, the recognized criterion for temporary disability is stricter: it is where the person cannot perform his normal duties for one or more shifts after the day of the accident, or where any bone is damaged, regardless of absence from work. (69)

The use of these definitions, however, mean in practice that frequency rates are affected by many factors other than those they are supposed to measure. For instance, consider the number of days which an accident causes a person to stay away from work. This varies tremendously, according to the doctor he happens to visit, and according to his own motivation. It is well known among the work force that some doctors tend to book people off for longer periods than others; and where companies do not have contracts with particular physicians, the liberal ones get most of the business of treating accident victims.

Also, workers differ greatly in their desire to return to the job quickly, and this in turn is affected by the firm's payment policy for the lost time. Since both frequency and severity rates are not simply measures of accidents, but also of time away from work, their validity is doubtful, for they measure things outside the scope of the firm's safety performance.

Other problems regarding validity arise over the vagueness of terms such as "perform effectively," "essential functions," and "normal duties." There are wide differences from company to company in the interpretations given to these expressions, affecting both types of injury rate. When a firm is trying to qualify for a safety award or win a competition, this is a convenient source of loopholes. For example, in one firm in Cape Town a cleaner was injured so badly in an accident that he was bedridden at home. To save the company's accident record, however, he was brought to work the next day and made to lie in the first-aid room with a broom in his hand: this was counted as "normal duties." Cheating on accident rates is a widespread practice. The present writer has questioned workers in scores of firms in the Western Cape about the matter, and in nearly every company, including winners of top national safety awards, employees were aware of serious cases that were not counted. In fact, making the reduction of injury rates a company objective often has undesirable effects: the more co-operation that is obtained in trying to bring the rates down, the more employees will "help" by failing to report accidental injuries, where

possible. If fewer accidents are reported, of course, less information is being obtained on accident causes, and less real progress can be made.

The problems over vagueness of terms are clearly less applicable to very serious injuries causing major permanent disability or death. Consequently, the suggestion is sometimes made that fatality rates would be better measures than disabling injury rates. Unfortunately, however, changing to a serious injury or fatality rate would magnify a further difficulty incurred with frequency and severity rates generally: the factor of luck. Especially where the number of employees is small, a firm or department with extremely unsafe conditions and practices can operate for years without experiencing a serious accident, or even a single disabling injury. For instance, one large construction firm in the Western Cape recently found that the site judged by inspectors to be the most dangerous had the lowest frequency rate, apparently because of luck. Again, the validity of injury rates as a measure of safety is questionable.

### 3.3.2 Measuring "hazards"

Although it is not used as often as frequency and severity rates, another measurement technique in injury prevention counts "hazards", shifting the attention from actual injuries to potential ones. For example, Simonds and Grimaldi recommend plotting on a graph the numbers of hazards found by a safety inspection team on regular visits to each department. The slope of the line will

supposedly show whether or not conditions in the department are becoming safer.<sup>(70)</sup>

William T. Fine has gone further and developed a method for assessing the seriousness of hazards mathematically.<sup>(71)</sup> Specified marks are given for three factors: seriousness of consequences, degree of exposure, and probability of an accident sequence starting. The degree of hazard is then measured by a Risk Score, defined as the product of the three assigned marks.

However, as methods of rating company or departmental performance, these proposals have serious weaknesses as well. The basic failing is that they both assume that a "hazard" is something that can be objectively identified and assessed. In practice, it cannot: whether or not a condition is judged as hazardous depends largely on the onlooker. For instance, it will depend on whether the observer is himself exposed to the danger, or only other people are; on whether the possible injury would have immediate effects, or only delayed effects; whether the observer is especially sensitive or not; whether the possible occurrence is of a type particularly dreaded; and so on.<sup>(72)</sup>

Thus, whether or not a pencil on the carpet is a tripping hazard cannot be decided objectively, as a question about the colour or position of the object could be: the judgement depends largely on the fears and the imagination of the person who makes it. In the words of the British Council for Science and Society :

... a hazard is not simply an objective phenomenon perceived in the same way by all who are concerned with it. Rather, it is an intellectual construct, made by people each working within the confines of a particular social setting, each with their own way of perceiving the world.(73)

It should not be thought that the criticism here is purely theoretical. Since there is no clear agreement on what is a hazard and what is not, telling a supervisor that twelve "hazards" were found in his department during an inspection will have little meaning to him. Nor will the slope of a line on a graph indicating numbers of observed hazards have much significance, as there is no assurance that an inspection team will be using the same criteria, and noticing the same types of problems, during each inspection. The difficulty in quantifying potential injury cases, therefore, makes this kind of measurement technique a poor one.

### 3.3.3 Measuring accident costs

A third method of measuring safety in a firm has traditionally been to assess the costs of accidents in various departments and in the company as a whole. Most safety officers agree that when properly used, this is the most effective way to obtain the interest of middle and upper management. There is a tendency in many firms to allow certain accident costs to be overlooked, since they are likely to be included in general operating figures for material, labour, and overheads. To many people, "the costs of accidents" denotes merely the costs of medical treatment and compensation for the effects of injuries,

which in any case are insured under Workmen's Compensation. But first, it is worthwhile considering that by preventing accidents and reducing claims to Workmen's Compensation, the company can earn lower assessment rates and rebates. Therefore, loss of these benefits is often also counted as a cost of accidents. Secondly, studies have shown that other costs usually outweigh the costs of medical attention and compensation. According to Frank Bird, for instance, for every dollar paid for costs insured by Workmen's Compensation, a firm loses on average from five to fifty dollars from production delays and property damage, plus an additional one to three dollars for miscellaneous items. (74)

When we consider cost assessment, the weakness in the traditional injury prevention approach is not in the choice of a measuring device, but rather in the way it is usually employed. Problems arise because the costs of accidents are calculated by a safety officer or safety committee, separately from the normal company cost accounting system. In the first place, this usually means that the accident cost figures are inaccurate, or based on guesswork. We noted earlier that in most firms a large proportion of accidents are not reported to the safety department; and this is especially true of accidents causing property damage and production delays, but no serious injuries. Receiving only a restricted sample of information, the safety specialist often tries to make a rough estimate of total costs by using a ratio and multiplying Workmen's Compensation figures. The ratio most

commonly utilized is derived from the work of Heinrich, who claimed that the total costs of accidents will average approximately five times the figure for compensation and medical costs.<sup>(75)</sup>

The safety specialist can also obtain more accurate estimates by calculating exact costs for small samples of various types of accidents, multiplying the average cost for each type by the number reported, then deriving a total. Obviously, however, the reliability of the second method is still dependent on a high incidence of reporting, which the safety department seldom gets.

Secondly, having a safety officer or safety committee report accident costs to higher management typically adds to the staff-line conflict we discussed before. Line supervisors and department heads often resent having a safety specialist, who is not even a cost accountant, telling the managing director how much waste they are allowing to occur because of accidents. They not only doubt the accuracy of the figures, but they also feel that if the costs are high, line managers will be blamed, while if costs are reduced, most of the credit will go to the safety department.

As we shall see in the next chapter, advocates of the Loss Control approach argue that these problems can be avoided if accident costs are handled in exactly the same way as items such as excessive material usage, breakages, high absenteeism, thefts, and so on. Under this alternative, the responsibility for measuring and controlling accident costs would belong to line

managers, not to a staff safety specialist.

### 3.4 THE FOCUS ON WORKERS' UNSAFE ACTS

In Chapter II, we noticed that the traditional injury prevention approach is based on the assumption that the overwhelming majority of accidents are caused primarily by the unsafe acts of the workers themselves. Consequently, most industrial safety programmes concentrate on training and motivating employees to be more "safety conscious." Although we have questioned whether these programmes are consistent with certain principles of good business management, it might appear that their main focus, at least, is supported by scientific evidence about accident causes.

However, when we take a closer look at the studies allegedly proving that unsafe acts are the main causes of between eighty and ninety percent of industrial accidents, we can clearly see that they have no scientific validity whatever.

A few writers have criticized these studies before, but on mistaken grounds. R.P. Blake, for instance, in discussing what he terms the "85% - 15% fallacy," claims that the ratio is fallacious because it wrongly assumes that accidental injuries are usually attributable to either acts or conditions. Instead, he argues, nearly all accidents result from multiple causes belonging to both categories.<sup>(76)</sup> But this criticism is ill-founded. Heinrich, for example, who directed the best known of

the studies which Blake is rejecting, was well aware of the multiple causation principle. He reached a figure of eighty-eight percent for unsafe acts, however, by selecting what appeared to be the primary causes in thousands of industrial accident cases, and deciding to which of the two categories they belonged. (77)

But Heinrich's study, and others of the same type, do suffer from two major weaknesses. One is that the information was derived entirely, or almost entirely, from reports submitted originally by people in middle management or staff positions in the firms where the accidents occurred. In practice, these reports are usually strongly biased, albeit often unintentionally, against the worker. For example, when an injury occurs because of inadequately guarded machinery or poor plant layout, the supervisor filling in an accident report commonly attributes it to a negligent action on the part of the injured person.

This is partly because he consciously or subconsciously wishes to avoid any possible blame; and partly also because, being pressed for time and having a limited interest in investigation, he tends to identify the immediate, most salient factor, which is generally a worker's overt movements preceding the occurrence. Very few company accident reports give information that is profound enough or objective enough to be used as evidence in a scientific study on the causes of accidents.

A second weakness in Heinrich's type of study concerns the justification for singling out one factor as "the primary cause"

of an accident. Not only is this judgement largely subjective in many cases; but also, further analysis commonly shows that the factor identified as primarily responsible is in turn the result of something else, belonging to a different category. For example, suppose a worker was injured when he forgot to lock an isolator switch in the off position before repairing a machine. The primary cause would probably be identified as the person's unsafe act, failing to use the lockout device. But suppose it were further discovered that his forgetfulness resulted from fatigue and distraction, caused by the poor lighting and excessive noise in the factory. In a case like this, is the "primary" cause still the unsafe act, or the unsafe conditions which produced it? The point is that even if a judgement about a primary cause could be made objectively, the factor that is selected will depend on the level of analysis. Thus, the claim that most accidents are caused by unsafe acts rather than unsafe conditions rests on a confusion, and not on any reliable evidence.

It may seem odd that the results of studies that are so clearly unscientific have enjoyed such wide acceptance for nearly fifty years. Even in recent publications, one still finds presented as an established fact the claim that unsafe acts are the causes of over eighty percent of accidents. To choose an example at random, the British Chemical Industry Safety Council stated in a 1972 report that "Reliable estimates place the proportion of accidents due to human error as 85 per cent of the total."<sup>(78)</sup> In seeking an explanation, one should remember that most of the

authors of books and articles on industrial safety are consultants to big corporations, heads of insurance divisions, and safety directors of large industrial firms. In general, their writings tend to be biased towards the interests of employers, who naturally favour the idea that workers cause most of their own accidents, as an argument against increased government legislation. Perhaps one day it will be finally discredited and discarded; but unfortunately, partly because of political interest, it continues to have a great amount of influence.

We shall postpone until the next chapter our discussion of a more acceptable view about the causes of accidents, and its practical implications for a Loss Control programme.

### 3.5 THE FOCUS ON FIRST-LINE SUPERVISION

We noted in the previous chapter that under the traditional injury-prevention approach, there is a clear distinction between the roles of the foreman or first-line supervisor, and higher management. Because the former deals directly with the workers (who supposedly cause most accidents) and directly controls conditions on the shop floor, he is seen as the "key man" in injury prevention. Top managers, on the other hand, assist by giving the supervisor encouragement and support.

The belief that efforts to reduce accident rates should mainly be directed at the level of first-line supervision stems from

certain assumptions about accident causes. One is the idea we have just rejected, that over eighty percent of accidents are caused primarily by the workers themselves. But another is a more general conception, regarding the entire series of causal factors preceding an accident. Again, the developers of injury prevention programmes have been strongly influenced by H.W. Heinrich.

In his book Industrial Accident Prevention, Heinrich argued that every preventable accident forms part of a fixed sequence of five types of factors or events. The items are :

1. Ancestry and social environment
2. Fault of person
3. Unsafe act and/or mechanical or physical hazard
4. Accident
5. Injury

Heinrich compared the operation of these events with a row of dominoes standing on end, where the fall of the first one causes the rest to fall in sequence. He also argued that most accident prevention work can be thought of as removing the third item from the series, that is, eliminating the unsafe act or condition which is the immediate cause of the accident. When this is done, even when there is a personal fault caused by ancestry or social environment, it will not produce an accident, as the causal sequence has been broken. Heinrich then mentioned one of the practical implications for accident prevention programmes :

The accident-prevention engineer is interested in all the accident factors but is not directly concerned with all of them. His work relates primarily to the accident and its prevention. Consequently his activities should center upon the factors immediately preceding the accident itself; these being the unsafe act and/or the mechanical hazard, and the proximate reasons why these exist. (79)

Suppose we consider Heinrich's theory of the accident sequence in the light of his claims concerning its utility and value.

Stating that its "tremendous significance cannot be overemphasized", and that an understanding of it may be "the most vital of all requisites in the practice of accident-prevention work,"

Heinrich argued that the principle is a valuable guide concerning (a) the type of information one should gather in investigating accidents; and (b) the selection of remedies for accident problems. (80) As we shall see, however, not only is Heinrich's accident sequence useless for practical purposes such as these, it also fails to meet the criteria to qualify as a worthwhile theory of accident causation.

One essential requirement of any genuine causal explanation or scientific hypothesis is that it must have empirical content; that is to say, it must be capable of being tested by evidence, rather than being true by virtue of the definitions of its terms. Let us compare a pseudo-explanation with a genuine one. The classic example in discussions of scientific explanations is the question of why opium causes people to sleep. Suppose the reason given is that opium contains certain alkaloids which depress the central nervous system. This, whether it is true or not, meets

the requirement of empirical content, since it is testable --- it can be verified or falsified by empirical evidence. It also provides practical guidance for scientific research, since it suggests certain specific lines of experimentation to test its validity. Now suppose one should answer the question by saying that opium causes people to sleep because of its dormative powers. This is not a genuine causal explanation at all, since it lacks empirical content: it is true purely because of the meanings of the words it contains. Nor does it give any practical guidance for research: since "dormative powers" would apply to any conceivable possibility as far as causes are concerned, the statement tells us nothing about specific causes to look for.

With this distinction in mind, let us now look at Heinrich's principle that a preventable accident occurs only as the result of a personal or mechanical (or physical) hazard. This is undoubtedly true, but by definition, rather than because of fact. First, any accident will obviously be caused by a "hazard," because of the meaning of the word; and the denotation of "personal or physical" covers all conceivable possibilities of what the causes of a preventable accident might be. In other words, Heinrich's principle is not informative, and not a genuine hypothesis or causal explanation at all, any more than the statement that opium causes sleep because of its dormative powers.

The same criticism applies to Heinrich's claim that preventable personal and mechanical hazards exist only because of the faults

of persons. At first sight, this might appear to have empirical content, to be testable by actually identifying hazards and seeing whether they were caused by personal faults. Suppose, for example, we find a case where the wind loosens some sheeting on a factory roof, the roof leaks, and some lifting equipment is badly corroded, eventually causing an accident. Would this count as evidence against Heinrich's principle? The answer is no, because again the principle is true by definition, and devoid of empirical content. The point to notice is that Heinrich is only referring to preventable accidents. As soon as we regard a case like the one above as preventable, we are admitting that some person might have prevented it, by for instance, conducting regular inspections to discover such problems and having them corrected. Heinrich conceded that "personal faults" includes not only physical and personality traits, but also "faults" of management and supervision. But this means that "caused by personal fault" is merely a logical implication of the notion of a preventable accident. Again, Heinrich's principle is a logical truism, not a causal explanation.

Finally, we need to consider the statement relating to the first stage of the accident sequence, that "faults of persons are inherited or acquired by environment." Again, the principle is untestable and uninformative, since "inherited or acquired by environment" covers any conceivable possibility: it tells us nothing about what the actual causes of specific faults might be, or even how to look for them. It is therefore, worthless as

a scientific hypothesis.

Our finding is, then, that Heinrich's accident sequence, which has been tremendously influential in the theory of industrial safety, is really nothing more than a series of empty tautologies from which no practical implications can be drawn. A chemist could not be guided in any way in his research into the properties of opium by being told that the drug causes sleep because of its dormative powers. Similarly, contrary to what Heinrich claimed, a safety specialist can obtain no practical guidance whatever in his work by studying Heinrich's accident sequence.

Once its supposed scientific underpinnings are removed, the traditional practice of concentrating accident prevention efforts on the level of first-line supervision is open to doubt. It certainly has the tremendous disadvantage of providing higher-level managers with a convenient excuse to confine their efforts to supportive functions such as signing general policy statements and handing over safety awards. Since accident prevention is then not a part of the everyday planning, organizing and controlling being performed at the higher levels of the organization, progress in reducing accident rates is hindered.

In the next chapter, we shall examine the alternative under Loss Control, and see how a more adequate view of accident causation tends to support it.

### 3.6 MOTIVATIONAL TECHNIQUES

Traditional injury-prevention programmes strongly emphasize the use of various motivational techniques to make workers "safety-conscious;" that is, to be aware of and help to correct hazards connected with their work, and to make a conscious effort to do their jobs safely. In the last chapter we made a brief survey of some of the most common methods employed, but now we need to consider their effectiveness.

A convenient account of traditional safety motivation is given by the National Safety Council in their Accident Prevention Manual. They list six "basic human interest factors," with the corresponding ways to use them in promoting industrial safety:<sup>(81)</sup>

<u>Interest Factor</u>	<u>Type of appeal</u>
1. Fear	posters and reports with shock value
2. Pride	trophies and awards for individual and group performance.
3. Recognition	publicity in newspapers and on bulletin boards
4. Participation	appointments to safety committees
5. Competition	safety contests
6. Financial gain	monetary rewards

This list does, in fact, give an accurate and fairly comprehensive picture of the motivational aspect of injury-prevention programmes. But are they, singly or collectively, good ways of achieving the desired goal?

### 3.6.1 The appeal to self-preservation

One of the most commonly-used methods of trying to make a worker safety-conscious is aimed at convincing him that in his job, he is exposed to a significant amount of risk of accidental injury. Posters and articles show him that other workers have been seriously hurt while doing work similar to his. Safety training courses not only emphasize the degree of risk, but also call his attention to types of hazards which he had never previously recognized. Many safety films employ shock tactics by showing colour close-ups of eye operations and amputations, and tearful stories told by widows and orphans.

Experimental evidence suggests, however, that the use of fear to motivate the worker in this way has little to recommend it, at least in most areas of industry. One study found that except in cases where a person recognizes a very high probability of an accident occurring, a "defence-avoidance" reaction sets in, where the person defends himself against feelings of anxiety by subconsciously rejecting, or quickly forgetting, the threatening message.<sup>(82)</sup> And certainly most workers in industry today do not feel that the chance of being seriously injured in an accident at work is very high. For instance, the present writer made a survey of fifty-two employees below foreman level, in five different companies, to find out whether the threat of work accidents ever seriously worried them: every person replied in the negative. These considerations help to explain why it has been found that even when the effects of shock tactics are appreciable, they are usually very transient as well.

The appeal to self-preservation is still popular in industrial safety programmes, in spite of its lack of support by experimental evidence, and the fact that it runs counter to accepted theories of worker motivation. For example, Maslow argued that human needs operate according to a hierarchy: when a basic need is satisfied, the person feels the influence of needs on a higher level. In Maslow's hierarchy, the most basic needs are physiological, followed by, in ascending order, safety, social, esteem, and self-actualization needs. At a given time most people are partially satisfied and partially unsatisfied to different degrees, on the various levels. Maslow stated :

For instance, if I may assign arbitrary figures, ... it is as if the average citizen is satisfied perhaps 85 per cent in his physiological needs, 70 per cent in his safety needs, 50 per cent in his love needs, 40 per cent in his self-esteem needs, and 10 per cent in his self-actualization needs. (83)

But if workers' safety needs are largely satisfied, an appeal directed at those needs should have a limited effect.

Naturally, workers in very dangerous occupations may be strongly motivated by the fear of accidents, so these methods will still have a role to play. However, many writers, especially those supporting a Loss Control approach, argue that for the majority of the work force, motivation to prevent accidents is more effective if it is aimed at higher-level needs, such as self-esteem and self-actualization, where the levels of satisfaction are lower.

### 3.6.2 Pride, recognition, and financial gain

In considering Maslow's theory and its significance for safety motivation, a proponent of the injury-prevention approach might object that other popular techniques fit the theory very well. For example, for individual and group safety achievements, workers have traditionally received awards and publicity, and occasionally even financial bonuses. Do these practices meet the requirement of appealing to higher, less satisfied needs?

The answer is that they do; but in practice, giving rewards specifically for safety usually engenders a conflict with other motivational factors in a firm, making the effects of the safety motivation fall short of the intended goal. Most workers certainly believe that pay rises and promotions, with their attendant recognition and financial gain, are based primarily on contributions to production and profits and not directly on accident prevention. In most cases, the magnitude and therefore the influence of these rewards will far outweigh that of safety awards and bonuses. Of course, whether or not there is actually any conflict between safety and productivity does not matter, as long as workers think it exists. The problem is even greater in firms offering production bonuses and other types of incentive schemes. In one recent survey, British workers were asked whether incentive schemes adversely affected safety, and sixty-two percent said that they did.<sup>(84)</sup> As a practical illustration, R.C. Dean described an attempt made to raise production in a local authority warehouse by paying an incentive bonus. One immediate

effect was a sharp increase in the number of unsafe practices, as workers took short-cuts for the sake of speed; housekeeping and other conditions deteriorated, and more accidents began to happen, including one that was nearly fatal. (85)

As we shall see in the next chapter, while advocates of Loss Control agree that appeals should be made to workers' job pride and desire for recognition and material gain, they argue that safety motivation should be harmonized, or even merged, with the motivational factors used to obtain efficient and high-quality production.

### 3.6.3 Contests

Experts on industrial safety have always argued that if given the opportunity, employees will show a strong desire to compete with others, either on an individual or a group basis. Contests of some kind are conducted in virtually every firm with an accident-prevention programme. For example, various departments in a firm compete to see which can attain the lowest or most improved frequency rate, or work the most manhours without a disabling injury. There are often similar competitions for different factories belonging to the same organization. Finally, firms themselves compete with others on a national basis: in South Africa in 1979, the National Occupational Safety Association handed out over 1 200 safety awards.

Contests can be very effective motivators in companies where

the right conditions exist, but elsewhere, their effects are often negligible, or even detrimental. From discussing safety competitions with workers in many firms, the present writer has found that the attitude of a large proportion of workers is that of scepticism or disillusionment. With interdepartmental contests, many employees believe they are not fair, because differences in critical factors such as the degrees of hazard in the operations performed, age and condition of tools, machinery, and buildings, and so on, are not allowed for in the rating systems. Second, as we noted in the previous section on frequency rates, workers quickly recognize when cheating is used to win the firm a national or intercompany award, and they become cynical about the entire purpose of the safety programme. To many workers, it becomes apparent that among the benefits of safety campaigns and competitions, top management is interested more in improving the company's public image than in protecting the health and welfare of employees. For instance, in one large motor firm in the Western Cape, an employee was threatened with dismissal after he visited his own doctor rather than the company doctor after an accident, and was booked off, breaking the company's sequence of injury-free working hours being counted for a national safety award. In cases like this, the contest has a worsening effect on company morale. Finally, competitions seem to have more potential as motivators in industries where the risk of accidental injury is fairly high. In very safe occupations, such as office work, for instance, contests to avoid accidents will typically be regarded as a meaningless gimmick.

Thus, although safety contests sometimes have a beneficial effect, because of the difficulties and disadvantages which they often entail, a few writers have begun to question the practice of comparing safety performance between departments or companies:

Do we really need to compare ourselves with others? Does such a comparison mean anything anyway? A company's safety record reflects many things: hazards, controls, employee morale, the climate and style of the company etc. It is difficult to see how or why a company should compare itself with others when all the items that go into the making of each company's record are different. It would seem that the only important things we need to know is whether we are getting better or worse in each period measured. (86)

#### 3.6.4 Participation

Attempting to motivate employees by obtaining their active participation in safety programmes has traditionally assumed two main forms: suggestion schemes and safety committees. Like contests, these measures are effective only under certain conditions, which are less common than safety specialists generally recognize.

Many recent studies in industrial sociology have shown that workers are usually better motivated to achieve results when they play an active role in setting objectives and deciding how to meet them. In the area of safety, however, one essential point is often overlooked: allowing participation in an accident prevention programme will have little or no effect, unless the climate and management style of the company generally encourage

employee participation. Many firms, for instance, manage production and other company functions in an authoritarian or paternalistic manner, and are surprised when workers are not very enthusiastic about safety committees and safety suggestion schemes. A few examples will illustrate why such attempts at motivation fail. One firm in the Western Cape, known for its authoritarian management style, instituted a suggestion scheme in which employees were promised bonuses for valuable suggestions to prevent accidents. The scheme was highly publicized, and a suggestion box was erected at a conspicuous spot. When the box was opened after six months, only one item was found: a letter written by a black worker, who thought he was putting it in a postbox. Another South African company introduced a similar scheme, but when a few employees submitted suggestions, the managing director refused to pay the bonus, saying that they were expected to submit such ideas in the normal course of their jobs, and therefore, their efforts were covered by their regular salaries.

Similarly, safety committee meetings are often a waste of time. In the first place, very few people enjoy serving on committees: it is curious that managers expect to motivate their employees in a positive way by giving them duties which they do not really like -- attending committee meetings. Secondly, the major stumbling-block is usually again the management style of the company. Where the management is authoritarian or paternalistic, encouragement to participate by serving on safety committees is

not taken seriously. Dan Petersen, for instance, points out that safety committees are often a curse, and cannot understand why they were ever initiated, since committees are seldom used in other company activities, except on high executive levels. (87)

In summary, then, there are significant weaknesses in the traditional motivational techniques employed in injury prevention programmes. We shall look at some alternative methods in the next chapter, under the theory of Loss Control.

## CHAPTER FOUR

### THE LOSS CONTROL APPROACH IN THEORY

#### 4.1 INTRODUCTION

So far, we have looked at the traditional injury prevention approach to industrial safety, and noted some of its major weaknesses. We shall now turn to Loss Control, a newly-developed alternative which is presently being discussed and implemented in many countries such as the United States, Canada, and the United Kingdom, and widely hailed as a great improvement over the older type of programme.

Our discussion here of the theory of Loss Control will be restricted in two ways. First, a Loss Control programme may cover the entire range of non-speculative risks incurred by a business, including areas such as security, control of labour turnover and absenteeism, fire protection, damage and waste control, environmental pollution control, and so on. However, our attention will be focussed purely on the area of safety, in order to decide whether Loss Control promises to be a more effective way of reducing industrial accident rates. Second, as we intend to test the theory of Loss Control by comparing it with efforts made by firms in the Western Cape to introduce the newer techniques into company policy, in this chapter we shall

only present a brief outline of the Loss Control approach to industrial safety. The reason is that with Loss Control, as with injury prevention, the details of actual programmes are likely to vary tremendously among different firms and different types of industry, while the general features of the approach remain more or less the same. Some individual differences will, of course, emerge in the next chapter, when we report the experiences of particular companies. But for the purpose of testing the theory, a sketch of the main principles of the Loss Control approach, along with an explanation of their alleged advantages, will be methodologically sufficient and less confusing. At the end of this chapter, before collecting the evidence we shall also make a few predictions about difficulties that are likely to be encountered in trying to change from injury prevention to Loss Control.

#### 4.2 THE CONCEPT OF LOSS CONTROL

In order to understand the idea and scope of a Loss Control programme, one should first appreciate the distinction between two types of risk involved in operating a business.

Speculative risks, such as those incurred by decisions on company loans and investments and marketing policy, are assumed as a kind of speculation or wager by the management, where company assets are deliberately risked for the possibility of gain. In addition, business operations themselves involve non-speculative (or pure) risks, since incidents can occur to

reduce company assets: these risks are not voluntarily chosen, and concern the possibility of loss without a corresponding gain. Examples of the latter type of risk are the risks of accidents and illnesses to employees, of theft and vandalism, of fire and explosion, of strikes and riots, and so forth. Although pure risks are often considered when certain speculative risks are taken, the distinction is embedded in the two senses of the term "risk," in one instance to mean wager, in the other to mean the probability of some undesirable event: it is the difference in speaking about the risk of raising the stake in a card game and the risk of falling downstairs, for example.

Bird and Loftus give a definition of Loss Control based on this distinction :

Loss Control is any intentional management action directed at the prevention, reduction or elimination of the pure (non-speculative) risks of business. (88)

Although we are interested specifically in its application to safety, one should recognize that the scope of Loss Control is extremely wide, encompassing not only the concerns of safety and health, but also, among others, production and inventory control, transport, fire protection, security, product liability, personnel management, and even insurance.

The theory and many of the techniques of Loss Control were developed in the United States and Canada during the 1960's and

early 1970's, largely under the influence of writers such as Frank Bird and Jack Fletcher. The new approach grew out of attempts to improve on traditional injury prevention methods, after a recognition of a few of the shortcomings we described in Chapter III. For instance, while working at Lukens Steel Corporation in America, Frank Bird realized that by restricting its attention to actual and potential injury cases, the safety department was obtaining only a small sample of information on underlying accident causes. After a study revealed that accidental property damage far exceeded personal injuries in both number of cases and total costs, Bird recommended that the safety department widen its scope of activities to cover total accident prevention, rather than just the prevention of accidental injuries.

Another major consideration was the support of higher management. Over the years, safety officers have often come to realize that top managers usually show a stronger interest in cutting costs and raising profits than in the firm's accidental injury rates. Extending an injury prevention programme into a total accident prevention programme helped, since significant financial savings were easier to prove. In a further step, the programme could be widened in the area of damage control to cover not only damage caused by accidents, but by various types of deficiencies in purchasing, operation, and maintenance, as well. At the same time, a number of people recognized the disadvantages in having various control functions managed by separate sections or departments, with little communication between them. Thus,

the idea evolved that a company should have a single, integrated programme to reduce all types of non-speculative risks. This concept was termed Total Loss Control because of the wide scope of application, but the work "total" was later discarded by many writers, who found that it encouraged the misconception that all losses should be controlled, or totally eliminated. With regard to the problem of securing the interest of top management in safety, the idea was that injury prevention would be "sold" to management as only one part of an integrated package of cost reduction measures.

The theory of Loss Control employs some important definitions to convey the notion that a control programme should be gradually extended to cover a wider and wider range of non-speculative risks. As we noticed in an earlier chapter, in writings on injury prevention the definition of the word "accident" usually contained some reference, either explicit or implicit, to actual or potential injuries to people. In Loss Control, however, the extension of the word also includes cases of damage to physical objects, whether or not there is any noticeable personal risk :

An accident is an undesired event that results in physical harm to a person or damage to property. It is usually the result of a contact with a source of energy (i.e. kinetic, electrical, chemical, thermal, ionizing radiation, non-ionizing radiation, etc.) (89) above the threshold limit of the body or structure.

Of course a Loss Control programme is not only aimed at

preventing accidents, it is also concerned with many other events, thefts for example, which do not fall under the above definition. The word "incident" is used for all actual and potential loss-producing events, including accidents :

An incident is an undesired event that could (or does) result in loss. This definition could also be expressed as "an undesired event that could (or does) downgrade the efficiency of the business operation."(90)

Before looking at the basic features of the Loss Control approach to accident prevention, it is necessary to dispel a common misunderstanding about what a change to this approach would involve. Because the scope of Loss Control is far wider than that of injury prevention, it is sometimes mistakenly thought that the difference in the two approaches lies essentially in the scope of the responsibilities of the Loss Control Manager, compared to those of the traditional Safety Officer, and in the types of incidents that will be reported to him. For instance, some people understand that when a firm changes to a Loss Control programme, the Safety Officer, who changes his title, is simply put in charge of other functions, such as security, fire protection, and so on, in addition to safety, and receives reports on a wide range of incidents that are not restricted to accident problems. In that event, safety, for instance, would be managed in about the same way as it was before, but would simply merge with other functions into a single department. It is important to realize, however, that this

is a serious misapprehension: as we are going to see, switching to a Loss Control approach involves making significant changes throughout the organization, affecting the duties and accountability of line personnel, company selection and training policies, measurement techniques, management style, and approaches to employee motivation. With regard to accident prevention, it is not just joined with other functions, it is managed in an entirely different way.

#### 4.3 BASIC FEATURES OF THE LOSS CONTROL APPROACH TO ACCIDENT PREVENTION

##### 4.3.1 Organization and Training

We noticed in previous chapters that under the injury prevention approach, safety is treated mainly as a staff function, a practice which gives rise to many serious difficulties. Under Loss Control, however, safety becomes primarily a line function: most of the traditional duties of the safety specialist, such as inspecting, investigating accidents, devising and applying remedies for accident problems, and so on, are formally assigned to line personnel in each department. The aim is to stop treating accident prevention as a special responsibility, or a special set of activities, but to subsume it entirely under efforts to improve efficiency. As Fletcher and Douglas have argued :

Safety people do a disservice to themselves, their management, and their profession when they draw attention to accidents as something special and apart from day-to-day operations.<sup>(91)</sup>

Thus, as an integral part of their duties to increase efficiency, line managers and workers will be expected to conduct inspections to discover possible causes of incidents, including accidents. Any incident where significant loss occurred or could have occurred will be investigated by line personnel, who will design and apply remedies, or find qualified people who can do so. Line managers will be responsible for motivating their workers to prevent accidents, not through any special techniques or appeal, but as a part of the general motivation to do their jobs well. Where job descriptions are employed, these duties relating to safety and efficiency will be explicitly included, and checks will be made by higher managers to determine whether and how well they are performed. A firm may assign these responsibilities down to the level of first-line supervision, but ideally they ought to extend down to the lowest level of worker. To obtain maximum participation, all workers might serve periodically on inspection teams, for example.

If most of the traditional duties of the safety officer are given to the line personnel, what happens to the staff specialist's role? In a company whose size or type of operations require such a position, the functions of the Loss Control Manager should mainly be to monitor the performance of others and give assistance where required, to aid communication and coordination of efforts between departments, and generally to help in planning, organizing, and controlling the business on matters relating to cost control.

One of the expected advantages of these organizational changes is a reduction in the usual line-staff conflict between the safety officer and others in the organization. We noted in Chapter III that dissension often resulted from differences in outlook and qualifications, along with a confusing overlap in duties. In a Loss Control approach, one requirement would clearly be that a Loss Control Manager would need high qualifications, far higher than the traditional safety officer, and a knowledge of and interest in the entire business, not just the single aspect of safety. Moreover, the proposed changes would remove any overlap of activities or responsibility between staff and line, which should also help to reduce conflict. At present, in most firms with a safety officer, the staff specialist has to approach line personnel to ask for their assistance. Under a Loss Control system, the situation should be reversed: since line are made entirely accountable for accident prevention, when help is needed they would presumably want to seek the staff specialist's advice.

Another organizational change under Loss Control concerns committees. On the principle that safety should not be treated as a special subject, safety committee meetings would be discontinued. Where the firm decided that committees were worthwhile, they would be established to deal with any problem of productivity, including those related to safety, and might operate best on an ad hoc basis, being formed to deal with specific problem areas, and disbanded when acceptable controls

were achieved. (92)

Personnel functions such as selection and training might also be changed under a Loss Control approach. First, safety would be integrated into the standards used for hiring people to do particular jobs, by ensuring that selection criteria included attitudes and physical and mental abilities required to perform the jobs safely and efficiently. Then, special safety training courses would be discontinued; instead, normal skills instruction and supervisory training would be designed with the aim of reducing accident rates indirectly, by stressing correct procedures and quality work. In addition, efforts would be made through training and supervision to render employees down to the lowest levels conscious of costs and the need to reduce them. Workers would be told, for instance, the actual cost of items commonly damaged or wasted in their departments, the cost per unit time of production delays, and so on, and would be made aware that efforts to reduce costs would become an important criterion in assessing the job performance of everyone in the organization for the purpose of pay rises and promotions.

#### 4.3.2 Reporting

Instead of reporting only accidental injuries, under a Loss Control approach employees would be required to report any incident where a significant loss occurred or might have occurred. Ideally, a single form would be used to report incidents concerning safety, fire, security, property damage, waste,

production delays, and all of the other areas covered under the programme. In addition, all employees, down to the lowest levels, would be expected to submit any observation or recommendation on improving efficiency, either upwards or downwards through the normal chain of authority, or else through a suggestion scheme or productivity committee. For the purposes of accident prevention, the main advantage of incident reporting over mere injury reporting is very clear: by receiving a greater amount and range of information on potential accident causes, those who are given the task of devising and implementing improvements can progress more quickly.

As we saw in the last chapter, many accidents, perhaps the majority in most firms, are never reported. The Loss Control approach attempts to solve this problem in two ways. First, by making everyone in the firm accountable for reducing costs, it is hoped that even when a person is not seriously worried by the risks of injuries, he will report accidents more willingly once he regards them as sources of loss. The difference, of course, is in the amount of importance ascribed to accidents: while under the injury prevention approach, it is difficult to convince most employees that safety is a part of the main aim of the business to make a profit, people can readily see the central importance of loss prevention. In theory, therefore, Loss Control should achieve better accident reporting.

Secondly, while voluntary reporting is especially unreliable for accidents causing small amounts of damage but no serious injuries, one technique described by Fletcher and Douglas would make the reporting of such incidents nearly impossible to avoid. Many companies employ a job request or work order system, where a repair or maintenance section will not correct damaged items until a written form is received from the department concerned. Fletcher and Douglas recommend including a code letter in the job order number to designate damage caused by accidents. As the labour and material costs are entered on the form when the job is done, by adding the amounts on the forms having the code letter the accounting section can easily ascertain the weekly or monthly costs of accidental damage in each department, and particularly large areas of loss can be recognized and investigated. The Loss Control Manager would need to make spot checks to ensure that code letters were being properly used.<sup>(93)</sup> By combining the report of accidental damage with the job request, therefore, the incidence of reporting in the firm would be automatically raised.

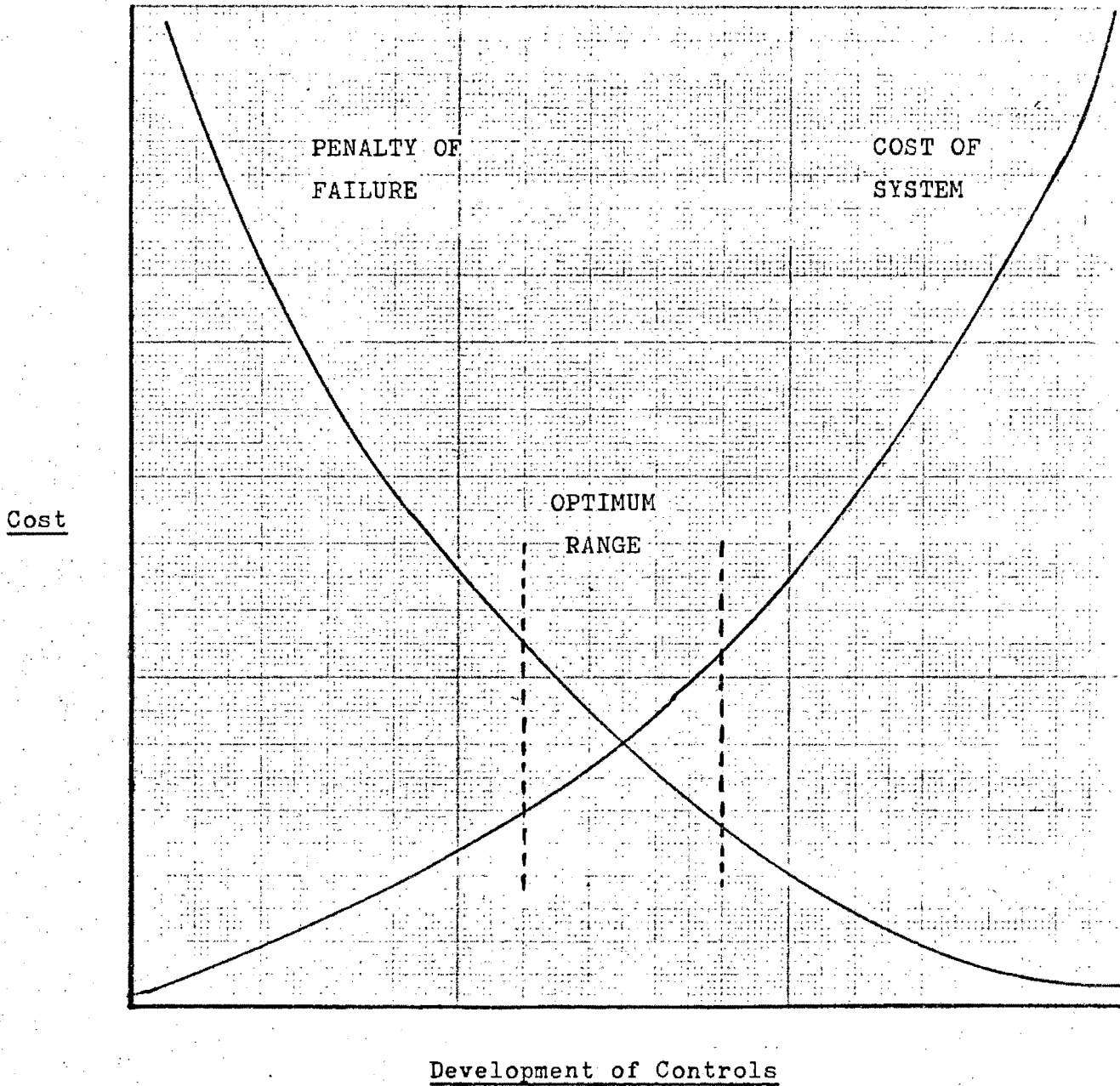
There are other techniques which are often associated with the development of very sophisticated Loss Control programmes. It is unnecessary for our purposes to mention them all, but a brief account of two such methods could be useful to show the connection with the general aims of Loss Control. To overcome the problem of unreported incidents, especially "near-misses," Frank Bird advocates the so-called "Incident Recall Technique," where a

person is carefully interviewed to elicit information about past incidents which he can remember, some of which were perhaps never reported.<sup>(94)</sup> According to Bird, this can be a valuable way to discover potential accident causes before serious accidents actually occur. A more comprehensive approach is System Safety Analysis, which includes a number of formal inductive or deductive techniques to analyze an operation and identify and assess the magnitude of inherent risks. For example, one can draw a fault tree logic diagram for a given operation, showing how faults can develop and the probabilities of undesired events taking place.<sup>(95)</sup> This type of analysis can be carried out at the design stage, and for complex operations can be done by computer.

When people are first introduced to Loss Control techniques aimed at increasing the flow of information about possible sources of loss, they often object that the amount of reporting and analysis being recommended would itself be excessively expensive. It is commonly felt, for instance, that if injury reporting is extended to incident reporting, employees will be too busy filling in forms to do much else, and the Loss Control department will be snowed under by thousands of written reports. This mistaken assumption arises because a cardinal principle of Loss Control has not been understood, which is that in a business operation, all activities must be cost-effective. Fletcher explained the situation very clearly with the use of a trade-off graph, shown on the next page (fig. 4). To the left of the graph, insufficient

FIGURE 4

TRADE-OFF GRAPH



control measures are permitting large losses to occur; but if the situation shifts to the extreme right, while those losses become small, the cost of the control system is so high that the total losses to the firm are just as great as before. The optimum range, of course, is near the middle where the control activities are cost-effective and the total loss to the firm is as small as possible.<sup>(96)</sup> With regard to reporting, for example, employees would be expected to report only those incidents where the actual or potential loss is sufficiently large to merit consideration; that is, where it will not cost more to report, analyze, and correct the problem than the problem itself deserves. Notice that this is another reason for educating all employees on the actual costs of items in their own departments.

#### 4.3.3 Measuring results

The management function of controlling business activities requires accurate methods of measuring success or failure. We have seen that the measurement techniques employed in traditional injury prevention are seriously deficient: frequency and severity rates are not statistically reliable, nor are they readily understood by most people in the firm; various ways of calculating "hazards" lack objectivity; and cost assessments are usually inaccurate and seldom believed.

In a Loss Control approach, the use of frequency and severity rates would be greatly de-emphasized or even discontinued, and

progress would be measured mainly: (1) by improved methods of costing; and (2) by evaluating various activities which tend to reduce accidents, without directly concentrating on the accident rate itself.

Few people take seriously a safety officer's periodic calculations of the total costs of accidents in a firm: it is well known that the figures are largely based on guesswork and inaccurate and incomplete reporting, by someone who is not even trained in cost accounting. No one bothers to try to match the safety officer's figures with the reports of operating costs issued by the accounting department; his only believable data are medical and compensation costs, which are largely insured anyway. To avoid these problems, in a Loss Control programme accident costs would be handled in much the same way as any other item such as excessive material usage, plant breakdowns, and absenteeism. Line managers should specifically investigate the costs of accidents whenever operating budgets are set, and also whenever discrepancies are found in comparing budgets with operating expenses. In the first place, managers largely base their budget estimates on past experience; and where this experience includes a high accident rate, future costs of accidents tend to be included automatically and covertly in projected total figures for material, labour and overheads: in effect, without being aware of it, the manager has budgeted for accidents and consequently later has a strong tendency to accept them when they are brought to his notice. Secondly, in devising budgets a lack of interest

in accident prevention can reinforce the well-known practice of inflating budgets to cater for unforeseen contingencies and to facilitate compliance with standards.

Whenever labour, material, or overhead costs exceed budget figures, line managers should be required to report what proportion of the particular expenses were attributable to accidents. For both purposes, it is very important that the necessary data be collected by routing incident reports through the accounting section, rather than merely to the safety department. Thus, the financial measurement of safety is incorporated into the firm's normal management accounting practices. For example, the monthly and yearly reports which the cost accountant issues for the guidance of line managers would not just show the direct and indirect labour costs for a particular department, it would also show the amounts attributable to accidents. The same would be done for material costs and overheads.

The seriousness of the particular firm's accident problems will, of course, dictate the degree of detail to which accident costs are analyzed. The use of a work order as a damage incident report as recommended by Fletcher and Douglas could easily become part of this type of cost assessment system; and there are also a few overheads, such as first-aid expenses and Workmen's Compensation insurance, that are readily retrievable and suitable as partial measurements of safety performance. (97)

In other areas of cost, some reliance on voluntary reporting of accidents will still be necessary. But counteracting the normal resistance to reporting is one of the manifold benefits promised by the Loss Control approach. By routing accident reports through the accounting section and having costs included in the regular financial reports, line managers are convinced of the accuracy of the figures and of the fact that higher management is regarding them critically. Since various total operating costs for a department are matched with the same costs owing to accidents, no advantage would be gained by trying to improve the accident figures by failing to report. For example, suppose the direct labour costs per unit output were high for a specific department during the month, but the cost of direct labour time lost because of accidents was shown as a low amount because of incomplete reporting. This would not help the department head and the line personnel under him, as other reasons would have to be found to explain the substandard performance, reasons likely to cast them in a worse light than would a failure to control accidents. Since the responsibility of identifying and reducing accident costs now belongs entirely to line personnel and not to a safety officer, once they are convinced of the accuracy of the measuring device the line should willingly report accidents as a way of finding areas for improved efficiency.

The other main type of measuring technique used in Loss Control evaluates activities which tend to product the desired results, rather than the results themselves. The number and quality of

inspections, incident investigations, job analyses, cost reduction suggestions initiated and implemented, on-the-job training sessions, and so forth, are recorded for each department and used to assess the managers responsible. The aim is to measure and thereby emphasize positive performance, rather than failures, i.e., accidents. Petersen explains the point very well :

Perhaps measuring our failures is not the best approach to use in judging safety performance. After all, this is not the way we measure people in other aspects of their jobs. We do not, for instance, measure line managers by the number of parts the people in their department failed to make yesterday. And we do not measure the worth of salespeople by the number of sales they did not make. Rather, in cases like these we decide what performances we want, and then we measure to see whether we are getting them. (98)

The important feature which identifies this as a Loss Control and not a traditional injury prevention technique is the fact that measured activities are not specifically identified as being aimed at safety, but are handled as part of a general programme to raise productivity.

#### 4.3.4 The role of higher management

We noticed in Chapter III that in the injury prevention approach, the job of the safety officer, and indeed the entire focus of the accident prevention programme, were reflected in and later influenced by Heinrich's theory of accident causation. The connection between a theory of causation and the practice of

prevention is easy to understand. We might assume that one prevents accidents mainly by: (1) considering an actual or potential accident; (2) asking, "What is the cause of this accident?" and finding the answer; then (3) taking preventive action by removing the cause.

The difficulty is, however, that in any actual example the answer to the question in (2) above is likely to be a multiplicity of factors. Suppose we use an illustration chosen at random from Heinrich's book. A worker who was pouring acid into a tank allowed his attention to wander, overfilled the tank, and was badly burned when the acid overflowed. The worker had neglected to wear protective gloves, apron, goggles and mask in spite of repeated instructions from his supervisor.<sup>(99)</sup> Now as Heinrich correctly observes, this accident results from more than one causal factor: the causes include the worker's unsafe act of pouring acid, his failure to wear protective clothing, weak supervision, and perhaps also poor process design, and inadequate selection and training for supervisors and workers. But how do we reconcile a multiplicity of causes with the task of choosing a point of attack for remedial action?

Heinrich argued that accident prevention efforts should mainly be directed at "proximate" causes; that is, the immediate unsafe acts or conditions: in the case above these would be the overfilling of the tank and the lack of protective clothing. Although he admitted the role of "underlying" causes arising from poor management, he advised the safety specialist to attempt

to deal with these only when other methods failed, for two reasons: first, because he believed anyway that most accidents are caused primarily by the "proximate" unsafe acts of the workers themselves; and second, because he felt that the safety specialist had little control over failings on higher managerial levels :

Inasmuch as the underlying causes of accidents are of a managerial or supervisory nature and also include "outside-of-the-plant", home, social, and environmental circumstances, the safety director or servicing safety engineer is somewhat handicapped .... What he can do is to present the facts as tactfully and impressively as possible to responsible and authorized executives. (100)

The practical implication of this view is that accident prevention efforts are concentrated on the worker and on first-line supervision, while higher management is merely expected to "support" the programme.

In contrast, in the theory of Loss Control the spotlight of concern is shifted to rest on underlying managerial faults. For example, Fletcher explains the basic concept of Loss Control as :

A concept that the best way to avoid accidents is to reduce or eliminate the breakdown in (101) administrative processes which cause them.

Frank Bird has even altered Heinrich's accident sequence to show the importance of management control. In Bird's sequence the

five elements are :

1. Lack of management control
2. Basic causes (personal or job factors)
3. Immediate causes (symptoms)
4. Incident (or accident)
5. Loss<sup>(102)</sup>

While Heinrich's model of accident causation has been criticized before with respect to its practical implications,<sup>(103)</sup> no one has explained on a theoretical level what is wrong with it, or why Bird's model which emphasizes management is a viable alternative. We performed the first task in Chapter III, by showing why Heinrich's sequence is unacceptable as a scientific theory, and now for the second task we need to consider how the cause of an accident is actually identified.

It is obvious first of all that an accident is an unplanned deviation from some activity or state of affairs accepted as a norm. In the example given above, the norm is regarded as pouring acid into the tank to a certain level, and the deviation (the accident) was the event of the tank overflowing. When we ask what the cause of an accident was, we want to know what conditions existed in the case before the deviation occurred which did not exist in the normal case, and made the difference between the accident occurring and things proceeding as expected. In other words, when identifying a cause we distinguish between what have been termed "standing conditions" (those which help

to produce the event but occur both in the deviant case and the norm); and "differential conditions" (those which "make the difference" between the deviant case and the norm). The crucial point to notice is that in a particular context, the distinction between standing and differential conditions depends upon one's point of view. In the example given, a supervisor is likely to regard as part of the norm the job procedure, training and selection practices, and certainly the standard of supervision; for him, then, the differential conditions will be the worker's lapse of attention and lack of protective clothing, and he will mention these in answer to the question "What caused the accident?" A manager, however, may regard distractions and resistance to wearing protective clothing as part of the normal state of affairs; from his point of view the differential conditions will be the other factors. Thus the correct answer to the question "What was the cause of the accident?" will in any particular case vary according to the context in which it is asked, and one's point of view. (104) So on a theoretical level, proponents of Loss Control are justified in stressing management failures as the causes of accidents.

In practice, therefore, instead of focussing mainly on the worker through first-line supervision, the Loss Control approach attempts to reduce accidents by improving management techniques at all levels of the company, extending to the top. Instead of performing a fairly passive, supportive role, top management is expected to include accident prevention in their everyday

tasks of planning, organizing, and controlling the organization. The assumption is that with the active participation of top management, results should be easier to achieve.

#### 4.3.5 Motivation

Loss Control tries to avoid the motivational problems typical of the injury prevention approach. First, in a Loss Control programme, as a general principle no special techniques or appeals are used for safety as opposed to other company functions such as production. This means that special safety competitions and the use of advertising devices to "sell" safety to the workforce would be largely discontinued. Instead, the approach to employee motivation is through a participative management style, job enrichment, and appeals to job pride, stressing efficiency and quality workmanship.

In practice, employees down to the lowest levels are expected to participate in inspecting their work areas, investigating incidents, and setting standards and devising improvements to raise productivity. The responsibility for carrying out these activities is made a part of their jobs; and their performance is evaluated as part of the criteria for giving pay rises and promotions.

This proposed change of approach is obviously intended to bring safety motivation in line with recent thinking in the fields of management theory and industrial sociology. Most of the alleged benefits are unnecessary to mention here, as they will be known to anyone familiar with the work of writers such as

Maslow, McGregor, Herzberg, Vroom, and Likert. One aspect, for example, is described by Joe Shakespeare, a leading British authority on Loss Control :

I believe that one of the greatest needs of work people today is to become part of the operations of a company. They want this group feeling, and not to be isolated and frustrated in a monotonous job. They are looking, if you like, for the total involvement that is the basis of loss control. (105)

Also, a few writers have suggested that besides reducing accident rates indirectly by improving overall efficiency, the job enrichment approach may also prevent accidents directly by removing elements of psychological stress. (106)

Finally, Loss Control tries to avoid the traditional problems of getting top managers interested in safety by convincing them that safety is only one component of a general programme to lower costs and raise productivity. By using techniques to measure the success of the programme purely in terms of money saved, it is hoped to reconcile the manager's concern with higher profits with the humanitarian goal of reducing injuries to company employees.

#### 4.4 PREDICTIONS CONCERNING THE OUTCOME OF THE SURVEY

Having taken a brief look at the theory of Loss Control, in the next chapter we shall turn to the survey that will be carried out to test the theory by determining what has happened

in firms where the change of approach has taken place. Before doing so, however, we need to depart from the views of overseas experts and present our own predictions about the applicability of Loss Control principles to the South African situation.

In this country, one major obstacle to implementing a Loss Control programme is likely to be the management style of the company. With its emphasis on employee participation at all levels, it is doubtful whether a Loss Control programme would be very successful where the management style was authoritarian or paternalistic; and certainly most South African companies, partly because large segments of the work force are very unsophisticated by Western standards and have low levels of education, do tend to be authoritative or paternal in their management approach. Consequently, except in the few companies where the required management style already existed, one would expect to find significant problems in changing to Loss Control, especially with regard to reporting practices and worker motivation.

Another difficulty is likely to arise from the attempt to incorporate safety in a general programme to reduce a very wide range of business losses. Compared with countries like the United States and England, South Africa is still a young developing nation where it is vitally important to achieve a high rate of economic growth. With an overriding concern with production and productivity, South African managers are likely

to be enthusiastic about Loss Control once they understand what it involves, but in practice one would also expect that they would regard the safety component of the programme as one of the least important elements. In other words, while the Loss Control approach tries to sell accident prevention to upper management as part of a package of cost reduction measures, there is a danger that even when the package is nominally accepted, managers will direct most of their efforts to problems traditionally regarded as crucial for productivity, and continue to give the safety aspect only token support.

Finally, we noticed in this chapter that the person who acted as manager, adviser, or coordinator of a Loss Control programme would need a high degree of managerial ability. In South Africa, where qualified managers are at a premium, especially at middle management levels, this is likely to present a problem. There would be a natural tendency to appoint existing safety officers as Loss Control Managers, but few South African safety officers today have the necessary abilities or qualifications for the more demanding position. One could therefore expect some Loss Control programmes to fail because staff personnel could not clearly understand the concepts, were not good enough managers to put them into practice, or both.

## CHAPTER FIVE

### LOSS CONTROL IN PRACTICE : A TEST OF THE THEORY

#### 5.1 AIMS OF THE SURVEY

A survey was designed as an experiment to test the theory of Loss Control and its applicability to South African industry, primarily to see whether the Loss Control approach does in practice have significant advantages over traditional injury prevention methods. In the Western Cape, an estimated two hundred different firms have sent management personnel to Loss Control courses and seminars over the past seven years, so one can assume that for the purposes of a survey a sufficient number of firms know about the new techniques, and have had enough time to implement them if they wished.

The question of how many companies in the Western Cape have actually decided to change from injury prevention to Loss Control is an interesting subject for investigation in itself. We have seen that according to writers such as Bird and Fletcher, top executives readily appreciate that establishing a Loss Control programme will help to reduce costs and raise profits. If that claim is true, one would expect to find a

large proportion of the firms where managers have heard about the new approach already practising it. On the other hand, if Loss Control has been adopted by very few firms, one should try to discover the reason.

Secondly, by identifying the companies where serious efforts have been made to develop Loss Control programmes, and by seeing what has been done and what problems have been encountered, a number of important questions might be answered :

(1) Is the Loss Control approach really a more effective way to reduce industrial accident rates than traditional methods? The survey will attempt to determine how some actual programmes are organized and how successful they have been, and results will later be compared to the theory and the alleged benefits of Loss Control described in Chapter IV.

(2) Is the Loss Control approach suited to South African conditions? In conducting courses on Loss Control, the present writer has heard some South African managers contend that although the new approach would probably work in the United States, Canada and Great Britain, it would be very difficult to employ here because of the different type of labour force and other special circumstances. Reports from firms experimenting with Loss Control should help us decide.

(3) The information gained in answering questions (1) and (2) should then be usable as the basis for answering the following: Should more South African companies try to develop Loss Control programmes; and if so, how should they go about it? For a manager who is deciding whether or not to change his firm's safety programme to Loss Control, our findings might serve as a practical guide, showing from others' experiences the steps that can be taken, and just as importantly, some pitfalls to avoid.

## 5.2 A DESCRIPTION OF THE METHOD OF INVESTIGATION

Identifying firms in the Western Cape which use, or claim to use, the Loss Control approach to accident prevention was an easy matter. The Goodwood office of the National Occupational Safety Association (NOSA) has contacts with over a thousand firms in an extensive geographical region, stretching from Oranjemund, S.W.A. to the north, through Namaqualand and down the West Coast, including Cape Town, and the area as far as Bredasdorp to the south, and as far east as Ceres and Swellendam. Safety advisers employed by the Association visit firms regularly and analyze their safety programmes. Consequently, the Regional Manager of NOSA, Mr R.H.P. Meyer, was approached and asked how many firms in his region had changed from traditional injury prevention programmes to Loss Control. His surprising answer was that the number was easily less than ten. We shall consider the reasons why so

few companies have turned to Loss Control later in this chapter, when discussing the results of the survey.

In order to test the applicability of Loss Control under varied conditions, it was decided to select firms in different types of industries, of different sizes, and located in different geographical areas, if possible. Accordingly, from a list of eight candidates five firms were chosen to represent the widest possible range. They comprised a construction company, a chemicals and explosives plant, a cement factory and quarry, a group of food producing and processing enterprises, and an oil refinery. Their sizes ranged from one with 300 employees to one with over 9 000 employees, and their locations varied as well: there were several operations in Cape Town, some in small towns within a hundred kilometer radius from Cape Town, and two firms with widely scattered operations extending to Saldanha, and to the Eastern Cape, the Transvaal and Natal. Regarding the number of companies studied, anyone who feels that five must constitute an insufficiently large sample should try to keep in mind that in fact it is over fifty percent of the total number of firms in the Western Cape which have changed from injury prevention to Loss Control. It was felt to be unnecessary to study all of the eight possibilities, since, for example, several belonged to the same industries and were known to have similar programmes.

The Regional Manager of NOSA supplied the name of the person

in each company who would probably know most about the Loss Control programme. Each person was contacted by telephone, the purpose of the survey was explained, and an appointment was made to hold a discussion. To make comparisons easier, it was decided to ask all of the respondents the same list of questions, touching on the major aspects of a Loss Control approach to accident prevention, and asking how successful the firm had been in achieving its goals. The questions were as follows :

#### QUESTIONS

1. When and how did your firm learn about Loss Control?
  - (a) Please describe how you yourself learned about it.
  - (b) Approximately how many other people on various organizational levels were formally introduced to the basic concepts?
  - (c) How did members of top management learn about Loss Control?
2. Why did the firm decide to change from injury prevention to Loss Control?
3. Did the change involve any altered responsibilities?
  - (a) Different duties of line personnel?
  - (b) Different duties of the safety officer or other staff safety specialist?
  - (c) Other (e.g., functions of safety committees)?
4. Did the change involve alterations in reporting procedures?

- (a) Do you use incident reports rather than conventional accident reports?
  - (b) Do you use any other special reporting methods?
5. How are the results of your accident prevention programme measured?
- (a) Do you use cost assessment methods?
  - (b) Any other methods (e.g. number of inspections, meetings, etc.)?
6. Does your Loss Control programme ensure any active participation on the part of top management?
7. Has the change to Loss Control involved any change in management style or motivational approach?
8. Is safety training given separately, or completely merged with induction training, supervisory training, etc.?
9. Has the change to Loss Control successfully achieved its objectives?
- (a) Was there a noticeable change in accident rates?
  - (b) Was there a noticeable improvement in reporting?
  - (c) Did the change cause any improvement in employees' motivation or morale?
10. What problems arose when attempting to apply the Loss Control approach in your firm?

Before we look at the data obtained from the survey, some points concerning their presentation should be mentioned. First, the study disclosed that the company programmes varied tremendously in their degree of sophistication, from

one barely deserving of the name "Loss Control" to one in which nearly all of the basic concepts have been applied. In the report to follow, the firms are treated in approximate order from the most primitive programme to the most complex.

Secondly, in conducting the survey an unexpected practical problem arose: in several cases the respondents stipulated that company names (and in a few instances their own names) should not be mentioned. For example, one respondent, a factory manager, had a standing instruction from the Board of Directors that in any information appearing in an article or thesis the company and its employees must remain anonymous. As a result, for the sake of uniformity it was decided to identify all of the firms by merely the letters A to E and short descriptions of their sizes and types of business. Documents obtained from some of the firms and employed as illustrations will have the company names obliterated.

### 5.3 THE RESULTS OF THE SURVEY

#### 5.3.1 Company A: a construction company (civil engineering) with approximately 1 000 employees

The respondent was a staff specialist in charge of training who also manages the Loss Control programme on a part-time basis. He was first introduced to Loss Control two years ago on a three-week NOSA training course, and has subsequently attended a seminar held by Frank Bird. Besides himself about five people, mainly engineers and site foremen, also learned about Loss

Control from Bird's seminar. No top management personnel attended.

The decision to develop a Loss Control programme was taken in 1976 after an engineer who was then in charge of safety explained the approach to the Managing Director, who agreed that it might help to reduce costs. The respondent believes that the Managing Director's understanding of Loss Control is limited to the fact that it is aimed at cutting various types of losses.

The adoption of an official Loss Control policy did not change the duties of line personnel or of the staff safety specialist in any significant way: it mainly consisted of rewriting management instructions to read "Loss Control" in place of "Safety". Regular safety inspections, for example, are still conducted by the staff specialist. On the other hand, at two locations safety committees were changed to Loss Control committees, which now discuss a wide range of problems affecting productivity.

The new Loss Control policy has not yet changed the firm's reporting procedures: supervisors still submit conventional accident reports, not incident reports, and no other methods have been tried.

Results of accident prevention efforts are still measured in the traditional ways, mainly by injury frequency and severity rates, and by Workmen's Compensation costs. Other cost

assessment methods are not employed because of accounting problems which will be mentioned later.

Adopting a Loss Control approach has not involved more active participation on the part of top management, nor has there been any shift in management style. One change in motivational techniques has occurred, however: as a result of the emphasis on reducing costs, employees on the construction sites are made accountable in an informal way for high accident rates, and this has now become a factor affecting pay rises and promotions.

Since the adoption of a Loss Control policy, there have been no noticeable improvements in the accident rates, in the incidence of accident reporting, or in employee morale.

The respondent admitted that the implementation of Loss Control methods has not progressed very far, but cited a multitude of practical problems, most of which he feels are probably characteristic of the construction industry, while a few are caused by practices within the firm. In construction, planned work is constantly being interrupted by unexpected and sudden emergencies, and there are also rapid variations in production demands. Even holding a meeting to discuss Loss Control becomes difficult, since key personnel are drawn away to deal with immediate problems. Secondly, in the construction industry authoritarian attitudes have always been firmly entrenched: the participative style inherent in Loss Control is not readily

understood or accepted. Also stemming from these traditional attitudes is a strong resistance to accepting responsibilities for costs. The new emphasis on the need for each site to reduce expenses and meet budget quotas has merely increased the tendency to "pass the buck". With any proposed improvement costing money, long arguments arise over "whose budget it will go on:" for instance, crane hooks with safety catches were recommended costing R700 each: site foremen and engineers insisted that the expense be charged against the safety department's budget and not their own. Until a firm accounting policy is agreed on to settle these arguments, and until accounting practices are developed to record total accident costs, measuring safety by means of the cost assessment methods described in books on Loss Control will be impossible.

Finally, two further practical problems were mentioned. One is that most company employees, on all levels of the organization, have only a vague idea concerning what a Loss Control approach is all about. The fact that construction sites are widely scattered geographically, and the fact that people never seem to have the time to attend meetings during working hours, makes training on Loss Control very difficult. Another interesting problem has arisen because the company has tried to implement Loss Control without a clear personnel policy on whether to fire or to retain people at the end of a contract. A worker who is unsure about his future with the company once the project is completed is not likely to be influenced by appeals for increased productivity. Because of all the

difficulties involved, the respondent believes that although the development of the firm's Loss Control programme will continue, progress will be slow.

5.3.2 Company B: an oil refinery with approximately 550 employees

The respondent, a staff specialist in charge of the safety and fire prevention programmes at the refinery, first learned about the Loss Control approach in 1972, at a seminar held in Johannesburg by Jack Fletcher. He has subsequently attended a number of seminars and lectures on the subject given by overseas and local experts, and has read several books on Loss Control. Besides himself, three engineers at the refinery have also attended courses and seminars, and on higher management levels the head of the engineering department and the production manager attended a course by Frank Bird.

The decision was taken to develop a Loss Control programme after the Fire and Safety Officer persuaded top management that it would save money. According to him, top management had always given complete support to the safety programme, especially in allocating the necessary finances, and similar backing was given to the request to implement Loss Control. The engineers and production manager were enthusiastic about the concepts of Loss Control as applied to areas such as purchasing, maintenance, energy conservation, pollution control, and so on; but accident prevention, except as regards damage to plant, was

left entirely in the hands of the safety officer, who on his side would not be concerned with production problems.

In the area of safety, an attempt was made at the start to assign line managers up to high levels the extra responsibility of conducting safety inspections and helping to investigate accidents; but this had to be discontinued when higher-ranking people complained that they lacked the time. At present the safety officer still inspects and investigates, accompanied by the line supervisor of the section concerned. The safety officer's duties changed little with the advent of Loss Control, partly because the policy at the refinery was based on that of the DuPont company in the United States, in which the safety department also deals with damage accidents and not just with actual or potential injury cases. The duties and the activities of the safety committee also remained unchanged.

The decision to apply Loss Control concepts was followed by a change in reporting procedures, but interestingly enough, not those connected with safety. Supervisors are expected to complete incident reports involving plant, but these are sent directly to the production and maintenance sections. Reports of accidental injuries are entered on a different form, and go to the safety department. The only other reporting procedure is via the "engineering service request," by which any employee can make suggestions on ways of saving money. Some of these

suggestions might improve safety, but they are considered and acted on by a special committee not involving the safety officer. No financial bonuses are given for valuable proposals.

The results of the refinery's safety programme are still measured in the traditional ways, by means of the disabling injury frequency rate and the number of manhours worked without a disabling injury. Except for noticing Workmen's Compensation assessments and rebates, no cost assessment methods are used for safety (only for incidents involving plant). No other measurements are applied.

Apart from the unsuccessful attempt to involve higher management in inspections and investigations, the attempt to develop a Loss Control programme did not involve any change in management style or motivational approach. Safety training is still treated as a separate subject, given in units interspersed with ordinary induction training. New process workers must pass a test on safety before they can be appointed on a regular basis.

Overall safety performance at the refinery has not noticeably changed since the decision to move to a Loss Control approach. The injury frequency rate was already near zero, leaving little room for improvement. Accident reporting and employee morale have not improved either. On the subject of motivational changes, the respondent said that understanding Loss Control

made him "hammer first-line supervisors more than he did before."

Finally, the respondent reported no serious problems at all in applying Loss Control concepts to safety. When asked the reason for his success, he replied that as he reports directly to the manager of the process division, and has the power to stop any dangerous operation, people are motivated by his authority.

5.3.3 Company C: a large firm in the food industry comprising fishing and agricultural operations, processing factories, and distribution branches, with about 9 000 employees

The respondent was the Group Loss Control Manager, who acts as adviser for the Loss Control programmes in all of the company's operations in various locations in the Western Cape, the Transvaal and Natal. He first heard of Loss Control in Rhodesia during the late 1960's from an expert visiting from Holland; and since then has read several books and attended many courses and seminars on the subject. Besides himself, four loss control officers and a few others in lower positions have attended Loss Control courses. No members of top management have done so.

The firm decided to establish a Loss Control programme in the early 1970's, when one of its divisions realized during a recession that its Workmen's Compensation assessments were too high. The respondent, who was then Security Manager in that

division, started to apply Loss Control techniques to identify various losses. After statistics were presented to top management, they realized the benefits of the Loss Control approach.

When first starting to implement Loss Control, the firm's management made a decision similar to the one we noted in Company B : that in identifying and controlling losses, production matters should be kept separate from areas such as safety, fire protection, and security, as much as possible. The scope of Company C's Loss Control programme was therefore limited to the following :

1. Accident prevention
2. Prevention of fires and explosions
3. Security
4. Gas risks
5. Hearing conservation

The change to a Loss Control approach has only slightly altered the duties of line personnel: they must now report more types of incidents than before, and sometimes are required to investigate accidents. The duties of safety officers, in the few divisions which have them, remained unchanged. Safety committees now deal with fire prevention and security matters as well, but production problems are not discussed.

Previously, written reports were only submitted on injuries involving Workmen's Compensation claims; but now employees must report all cases of accidental injury or damage. A monthly summary of accident problems and their estimated costs is then incorporated in the regular personnel reports (which also includes information on labour turnover, absenteeism, training, and so on), which is submitted by each unit or branch and reviewed by higher management.

In adopting a Loss Control approach, the firm decided to de-emphasize the use of frequency and severity rates as measures of progress, and to stress cost assessments largely based on Workmen's Compensation expenses. Each branch is given the objective of reducing its annual ratio of claims to assessments to  $24\frac{1}{2}\%$  or less, in order to earn the maximum merit rebate. Each month the Loss Control Manager sends a graph to every unit showing their progress in achieving this goal (see the company memorandum, fig. 5). Another costing method to cover production delays and damage is now being planned for initial use in the trawling division.

The respondent feels that Loss Control has been tremendously successful in getting top managers actively involved in accident prevention, and has also helped in changing the entire motivational approach and style of management within the firm. In the past, the approach was very authoritarian: people were warned to avoid accidents, and when they occurred, those at

MEMORANDUM

The Manager,

To.....

FROM..... [REDACTED].....

REFERENCE No..... HER/JH.....

14 December 1977.

MONTHLY ACCIDENT CLAIM STATISTICS

Attached is a graph relating to the W.C.A. claims experience for your branch. The explanation is as follows:

1. Each branch is assessed annually by the Workmans Compensation Commission in respect of Accident Fund premiums payable. Your estimated assessment for 1978 is
2. If, due to a high claims rate for accidents you exceed the assessment total, you will be surcharged for the excess and your assessment rate for the following years is likely to be increased.
3. If, due to a low accident (and therefore low claim rate) you claim 60% or less of the amount of your assessment, you will receive a cash rebate of 2% of the amount of the assessment paid at the end of each 3 year cycle. If you reduce your claim rate to 24½% or less of the assessment figure, you will receive in cash in the form of merit rebate 50% of your assessment. In the case of your branch this would be R            for the current year and based on expected assessment escalation rates, R            for a three year cycle. The merit rebate works on a sliding scale.
4. The graph shows:
  - (a) The amount of your annual assessment
  - (b) The target figure of 24½% of your assessment
  - (c) A red line showing your actual claims in relation to your assessment and target will be entered on the graph and a copy will be forwarded to you monthly as soon as your personnel return is received at Head Office and the figures extracted by this section.
5. Queries have been received from branches as to how to obtain the information required for the return. A simple method is as follows:
  - 5.1 Apart from any other records maintained, the staff member dealing with WCA claims should keep a sheet of paper ruled into two columns.
 

These should be headed:

    - (a) Compensation
    - (b) Medical

2/.....

- 5.2 Head the sheet: WCA Expenses for month of .....
- 5.3 In column "A" list all cheques received from the WCA fund Commissioner for the month concerned. In column "B" list all claims by Doctors, Hospitals, Specialists, Surgeons, X-Ray clinics, Medication: in other words all medical expenses for the month concerned.
- 5.4 This list is for the current month, bears no relation to any particular accident, and may include compensation for claims settled in respect of accidents which happened years ago. It is still current claims expenditure. This sheet should be totalled at the end of the month and will give you the totals required for the monthly personnel return from which the current expenditure will be extracted and monitored on the graph.
- 5.5 Where the comparison graph shows the claims rate to be on or below the target figure, this indicates a satisfactory accident rate and maximum cash rebate will be automatically refunded. If this is maintained for a period of 12 months or longer, and the assessment rate is higher than 1%, application will be made to Pretoria for a reduction in the rate on the grounds of favourable claims experience for the branch concerned.
- 5.6 Where the graph shows claims rate to be above the target figure, assistance will be given by this section to reduce the claims rate to (or as near as possible) the target figure.
- 5.7 The total WCA Contributions paid by the Company for 1976 were R204 869 of which approximately R12 000 will be obtained in merit rebates. The actual cash loss sustained was therefore R90 434. The 1977 rebate figure will exceed R100 000 and it is intended to make every effort to obtain as much of the 1978 and subsequent years rebate as possible.



A handwritten signature in black ink, appearing to be 'D. van der Merwe', is written over a horizontal line. The signature is stylized and cursive.

fault were often disciplined and even discharged. As the interest has changed to positive ways of improving productivity, the negative, disciplinary approach has tended to diminish. Because top managers have been able to see the financial savings from accident prevention, they now carefully analyze the monthly and annual reports. There has developed between the different units a spirit of competition to reduce the costs of accidents, and in turn cost consciousness and increased job pride have begun to permeate the organization. While Loss Control has not been the sole cause of these attitudinal changes, it has apparently been one of the major factors.

With regard to training, safety is still treated as a separate topic, but the courses are given as part of the normal induction process.

The benefits of the firm's Loss Control programme have been dramatic: since its inception, for instance, the Cape Town branches have achieved a 300% improvement in merit rebates from Workmen's Compensation, and a 50% improvement in injury frequency rates. The rate and quality of accident reporting has also improved, along with general employee morale: the latter change is evidenced by noticeably lower absenteeism, labour turnover, and internal security losses. Finally, the respondent reported three main practical problems in implementing Loss Control. The first was that of convincing higher management that it was necessary to change from the traditional methods, especially in the absence of any past records of the costs of accidents

to prove financial justification. Second, once the Loss Control approach was accepted, it became difficult to find suitably qualified people to assist in carrying out the programme in the various divisions. Third, the respondent felt that it was difficult for one person to act as manager or adviser for security at the same time as safety, because people tend to regard a security man as a kind of policeman, and this hinders his efforts to get them to help voluntarily to prevent accidents.

5.3.4 Company D: a cement factory and quarry employing about 300 people

The respondent, the Works Manager, first learned about Loss Control in 1975, from a "risk management" organization, which studies a firm's operations and assesses various kinds of risk for the purpose of selling industrial insurance. In the following year NOSA conducted two orientation courses on Loss Control for all managers down to the level of foreman; and one of the sessions was attended by the Chairman, the General Manager and Assistant General Manager, the Financial Directors, and two Works Managers. Subsequently top management decided that the firm would develop a Loss Control programme as a way of saving money.

Adopting a Loss Control approach altered the duties of line personnel in two ways: they must now report more types of incidents, and all line managers are now responsible for reducing costs. The functions of the safety officer in

inspecting, investigating accidents, etc., did not change, but he was given extra duties in areas such as security and fire prevention. The safety officer inspects and investigates as part of a team, with line managers. The previous safety committee was changed to a Loss Control committee, and discusses damage incidents, security and fire, and production problems as a regular part of the agenda.

With regard to reporting, besides the traditional injury reports, the firm has developed an interesting procedure which combines the job card system with voluntary reports on other kinds of incidents. Three separate forms are used: a preliminary report, an incident report showing the results of an investigation, and a third report showing the actual costs of remedial action. Anyone who observes an incident which might cause the firm to lose R100 or more submits the preliminary observation report. The incident is considered by the safety officer or by the planning committee to decide if the actual or potential loss is indeed over R100, and whether remedial action would be worthwhile. If so, a job request is made, and the costs of labour and materials from the job card are entered on the third type of form. The second and third reports are reviewed by the Financial Manager and the Assistant General Manager. The reason for having three separate report forms is, of course, to avoid unnecessary work on unimportant items.

The firm measures the success of its safety efforts by the disabling injury frequency rate, and by a total injury frequency rate which includes all minor injuries as well. A cost

assessment method is also used, since the savings shown on the third incident reports are totalled annually and compared with previous years.

The Loss Control programme has ensured the active participation of top management mainly through their review of the incident reports. They have expressed their satisfaction with the new approach, as it has saved money, made employees cost conscious, and generally raised company morale. Since the adoption of Loss Control the style of management, in the respondent's opinion, has definitely become more participative in character. Performance in reporting and preventing all types of incidents has become one of the unofficial criteria for deciding pay rises and promotions. Safety training is still handled as a separate module in the induction process.

Loss Control did not noticeably lower the accident rates: the firm had already reduced its disabling injury frequency rate to a very low level (about 4.5) for its type of industry, and the figure has tended to stay constant ever since. The new approach did, however, make a great improvement in the incidence of accident reporting, especially with respect to minor cases, partly because unreported accidents can be brought to light when any onlooker submits a preliminary incident report.

The respondent has experienced very few practical problems in

applying Loss Control. While line supervisors initially resisted the extra paperwork involved in reporting incidents, this was overcome by making the preliminary report as simple as possible. Secondly, the practice of including production problems on the agenda of the Loss Control committee wasted time when trivial issues were discussed at length by all of the members; this was solved by having minor problems handled by a subcommittee in each section.

5.3.5 Company E: a manufacturer of acids and other chemicals, explosives, and vinyl products, with approximately 2 100 employees

The respondent was the firm's Safety Officer, who also acts as adviser and coordinator for Loss Control. He learned about Loss Control in 1970, when a newly-appointed Production Director from England, who had experience with Loss Control when working for Imperial Chemicals, recommended that Company E develop their own programme. Since then, the respondent, the Chief Engineer, and all senior section engineers, section managers, and production managers have attended a number of courses and seminars held by Frank Bird, Bob Loftus and Jack Fletcher, and about twelve supervisors have attended NOSA courses on Loss Control. The firm decided to change its highly successful safety programme in order to apply principles of Loss Control after the Production Director showed that in ICI, the costs of injuries formed only three percent of the total measured losses, including those caused by production delays, thefts, accidental damage, and so on.

With the initiation of the Loss Control programme, the duties of line personnel were expanded with regard to incident reporting, inspecting and investigating, and submitting suggestions on ways to reduce costs. The functions of the safety officer changed as well: as the direct responsibility for inspections and investigations was shifted to the line, he became more of an advisor and coordinator, checking on progress, helping to inspect and investigate only as part of a team, and keeping records of various loss figures for presentation to higher management. Safety committees were changed to Loss Prevention committees, dealing with a wide spectrum of loss areas (including production matters) as part of the regular agenda (see a copy of the agenda, fig. 6). The firm operates with a total of twenty-seven such committees, with membership ranging from the Assistant Manager down to workers on the shop floor.

Reporting was extended to cover all kinds of incidents, instead of just injuries, and the normal report form includes questions requiring the line manager to conduct a careful investigation (see fig. 7). Several other methods of obtaining data on actual or potential incidents are also used. First, every employee is expected to submit Loss Prevention Observations to report any observed incident or suggestion for saving money (see fig. 8): over nine hundred of these are received annually! Secondly, the firm has appointed many line supervisors under Regulation C7(2) of the Factories, Machinery and Building Work Act, which requires assistants to the Chief Engineer to report

██████████ Factory

CENTRAL LOSS PREVENTION COMMITTEE

A G E N D A

Responsible  
for reporting  
action taken

CONFIRMATION OF MINUTES OF THE PREVIOUS MEETING

1. TO CREATE AND MAINTAIN ENVIRONMENTS WHICH DETER LOSS

- |       |  |        |
|-------|--|--------|
| 1.1.  | Good Housekeeping (see Annexure)                       | SO     |
| 1.2.  | Observations and follow-up (see Annexure)              | SO     |
| 1.3.  | Machinery Safety                                       |        |
|       | 1.3.1. Mechanical                                      | CE     |
|       | 1.3.2. Electrical                                      | SES    |
|       | 1.3.3. Transport                                       | FDO    |
| 1.4.  | Storage and Handling                                   | FDO    |
| 1.5.  | Dangerous Materials                                    | CC     |
| 1.6.  | Clothing and Protective Equipment                      | SO     |
| 1.7.  | Health, Industrial Hygiene & First Aid Courses         | SO/MO  |
| 1.8.  | Noise & Radiation                                      | SO/NAO |
| 1.9.  | Pollution Hazards and Wastage                          | PSA    |
| 1.10. | Compliance with the Factories Act, Chapter IV          | CE     |
| 1.11. | Fire, Traffic & Crime Control:<br>Emergency Procedures | FScO   |
| 1.12. | Energy Conservation                                    | SES    |

2. TO TRAIN AND DISCIPLINE PEOPLE TO WORK & LIVE WITHOUT LOSS

- |      |   |        |
|------|---|--------|
| 2.1. | Safety Training and Induction (White, Coloured and African) | STO/SO |
| 2.2. | Foremen's Meeting   | SO     |
| 2.3. | Discipline  | CE     |

3. TO STIMULATE LOSS CONSCIOUSNESS IN ONE AND ALL

- |      |   |        |
|------|---|--------|
| 3.1. | Off the Job Safety Training             | SO/STO |
| 3.2. | Safety in the Home (Monthly Newsletter) | FA     |
| 3.3. | Safety Films and Safety Talks           | SO     |
| 3.4. | Posters and Literature                  | SO     |
| 3.5. | Reported Losses                         | SO     |
| 3.6. | Factory and Departmental performance    | SO     |
| 3.7. | Serious Incident Information            | SO     |
| 3.8. | Sister Factories                        | SO     |

4. GENERAL

/am  
25 10 1978



(Continued)

6. Person(s) involved:

Name \_\_\_\_\_ No. \_\_\_\_\_ Race \_\_\_\_\_ Age \_\_\_\_\_ Shift \_\_\_\_\_ Service \_\_\_\_\_

Name \_\_\_\_\_ No. \_\_\_\_\_ Race \_\_\_\_\_ Age \_\_\_\_\_ Shift \_\_\_\_\_ Service \_\_\_\_\_

Witnesses: (1) \_\_\_\_\_ No. \_\_\_\_\_

(2) \_\_\_\_\_ No. \_\_\_\_\_

7. Was incident caused by:

Driven Machinery?	Yes	No
Action of another person?	Yes	No
Deliberate violation of rules?	Yes	No
Reckless disregard of any terms of Law?	Yes	No
Drunkenness?	Yes	No

Was his action at the time in connection with his work? Yes No

Was the operation:

Authorised?	Yes	No	Properly supervised?	Yes	No
Done in correct place?	Yes	No	Done at correct time?	Yes	No
Done in correct manner?	Yes	No	Done with correct tools?	Yes	No

Was the Operator:

Authorised?	Yes	No	Trained for this operation?	Yes	No
By whom? _____			How? _____		

If operation required a Clearance Certificate was one obtained? Yes No

Were conditions specified in the Clearance Certificate observed? Yes No

If operation required protective clothing / was it worn correctly? Yes No

8. Person(s) accountable:

Supervision

Worker

9. Conditions at time of incident:

Weather: Dry   
Wet

Wind: Light   
Strong

Temperature: Cold   
Mild   
Hot

Light: Poor   
Good

Ventilation: Natural   
Artificial

Noise: Medium   
High

10. Recommendation to prevent a recurrence \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

Signed: \_\_\_\_\_  
FOREMAN/SUPERINTENDENT

Date: \_\_\_\_\_

Comments by SM / SE / HOD

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



in writing unsafe acts and conditions, and make written recommendations on improving safety; and checks are made within the firm to ensure that appointees fulfill their obligations. Thirdly, safety has been incorporated in the hazard analysis and operability studies carried out to assess the design, purchase, operation and maintenance of plant, and in all types of efficiency studies, including work study exercises, done in the factory. Finally, special incident reports concerning safety are submitted regularly from the Security section.

Besides the traditional method of using injury frequency and severity rates to measure safety performance, a cost assessment technique is used, based on incident reports. Both the submission and the follow-up of incident reports are channelled through the Accounting section, where costs are entered on the forms. A monthly Loss Prevention Report shows the money lost in each department through injuries, security losses, fire, production delays and demurrage, wastage, labour turnover, and equipment damage (see fig. 9). Annual figures are compared with those of previous years, and the monthly Loss Prevention Report is compared with the normal report of operating expenses for the various departments. In addition, top management monitors departmental performance by noting the number of Loss Prevention Observations submitted monthly in each department.

Company E's top management have been actively involved in the

COST OF INCIDENTS

Month: \_\_\_\_\_

THIS MONTH	Injury	Security	Fire	Production		Lost Mat. & Prod.	Labour Turnover	Equip Dam.
				Actual	Potential			
Acids								
Blasting Explosives								
Vinyl Products								
Services								
Productivity Services								
Civil Engineering								
Distribution								
Engineering Company								
Security								
Factory General								
Laboratory								
Medical								
<b>TOTAL</b>								

YEAR TO DATE

Acids								
Blasting Explosives								
Vinyl Products								
Services								
Productivity Services								
Civil Engineering								
Distribution								
Engineering Company								
Security								
Factory General								
Laboratory								
Medical								
<b>TOTAL</b>								

ACTUAL TOTAL LOSS TO DATE: \_\_\_\_\_  
 (Excluding Potential Losses)

• DEMURRAGE

STATISTICAL

	Lost Time			All Incidents			Housekeeping Symbols							
	Mth	Ytd	Fr.	Mth	Ytd	Fr.	1	2	3	4	5	6	7	8
Acids														
Blasting Explosives														
Vinyl Products														
Services														
Productivity Services														
Civil Engineering														
Distribution														
Engineering Company														
Security														
Factory General														
Laboratory														
Medical														

FACTORY LT FREQUENCY: \_\_\_\_\_

Signed: \_\_\_\_\_

FACTORY ALL INC. FREQUENCY: \_\_\_\_\_

Loss Prevention Officer

safety programme since 1955, when they became concerned about the firm's high injury frequency rates, so no great changes were made in that respect by the introduction of Loss Control. The approach to safety after 1955 was modeled on that of the DuPont Corporation in the United States, where, as with Loss Control, personnel on all organizational levels are made accountable for accident prevention. The development of a Loss Control programme also had little effect on management style or motivational techniques, since the firm was already using a participative approach, and stressing job enrichment and job pride. Safety has been fully integrated into all types of company training, but separate safety courses are conducted as well.

The Loss Control programme has had no noticeable effect on the injury frequency and severity rates, since the previous injury prevention programme was so successful, there was little room for improvement: by 1964, for example, the firm's frequency rate was already below 2. Loss Control did, however, greatly improve reporting practices, especially in the numbers of minor injury cases and incidents not involving personal injuries that were reported. The respondent believes that Loss Control has helped to raise morale and produce a general cost consciousness throughout the organization.

Several problems were experienced when the concepts of Loss Control were put into practice. First, supervisors initially

resisted the increase in paperwork when they were asked to report all types of incidents instead of just injuries. This was especially true during peak production periods, because of the pressure of work, and also when operations were running smoothly: supervisors did not readily see the importance of investigating potential losses which had never actually materialized. This problem was largely remedied by the Loss Prevention Observation cards, as departments began to compete with one another with regard to the numbers and value of observations submitted to higher management. The feeling of competition started with the heads of departments and later spread to lower levels.

In spite of the company's management style, another problem was overcoming the fear of discipline when financial losses for each department began to be shown on the Loss Prevention Report; but this has been largely solved by a positive approach from top management, who have emphasized and rewarded efforts to bring the loss figures down.

Finally, the respondent mentioned as a minor problem the fact that Loss Prevention Observation cards are often submitted for the wrong reasons, when one employee uses them to tell higher management something detrimental to another employee, against whom he has a personal grudge. In general, however, the respondent is highly enthusiastic about the success of the Loss Control approach in his firm.

In previous chapters, we described the traditional injury prevention approach to industrial safety, noted some of its major weaknesses, and explained how in theory Loss Control is a better alternative. We now need to consider whether the results of our survey confirm or disconfirm the claims made in favour of Loss Control.

Proponents of Loss Control such as Bird and Fletcher have argued that the new approach is more effective in getting top managers to support safety, since it includes safety as only one component of a cost reduction programme, whose benefits in relation to company profits managers easily recognize. But if this is true, why have so few firms in the Western Cape developed Loss Control programmes, in spite of the fact that Loss Control principles have been widely disseminated during the past seven years? In answer to this question, Mr. R.H.P. Meyer, the Regional Manager of NOSA, who has wide experience in talking to top managers about their safety programmes, gives two main reasons. First, although hundreds of managers have attended courses and seminars on Loss Control, very few people on higher management levels ever attended: they nearly always regard themselves as too busy, and send underlings, middle management personnel, in their place. Afterwards a Managing Director, for instance, often fails to ask his subordinate what the seminar was about, or when he does he is not impressed by the information gained at second-hand. Second, according to Mr Meyer most top managers are definitely not interested in

safety, and when they hear about Loss Control they regard it as merely a different form of the traditional safety programme. Probably their tendency to assume this is partly because most of the overseas experts on Loss Control have been sponsored in South Africa by the National Occupational Safety Association. As a result, without the understanding or support from top managers, most firms who say they have Loss Control programmes turn out to have them in name only.

Thus, the claim that higher management will usually welcome the suggestion to develop a Loss Control programme must be qualified in certain important respects, based on the evidence gained from our survey. While it is true that in all of the companies we studied, top managers were keenly interested in the idea of a comprehensive cost reduction programme, it is noticeable that the two firms with the most advanced and successful Loss Control systems are also those whose top managers attended courses and seminars on the subject. This does not prove that formal training is required to make managers understand and accept Loss Control; it may simply indicate that only managers who are initially interested enough to attend the seminars themselves are also interested enough afterwards to help put Loss Control into effect. But the evidence suggests that the prospects for the success of Loss Control strongly depend on where the idea of adopting the approach originates. Where staff or line supervisors have to

persuade upper management that the approach is worthwhile, the ideas are often rejected, or else accepted halfheartedly to the later detriment of the Loss Control effort.

Another point which emerges from the survey has also never been noted in books and articles on Loss Control. Management acceptance of Loss Control is balanced on a knife's edge: if emphasis is placed on the safety component of a Loss Control programme, managers are likely to dismiss the entire approach; but if other elements are emphasized, especially those closely associated with production, managers may well concentrate on them and continue to neglect safety. For example, we saw that in Companies B and C a formal division was made between production matters on the one hand, and areas such as safety, fire prevention, and security on the other; and in both firms it was evident that the split was made to prevent concerns regarded as relatively unimportant from interfering with production management. This practice, of course, violates the basic Loss Control principles that safety should not be treated as a subject separate from production, and that all employees should participate in helping to reduce a full range of business losses. In Company A, the situation was even worse: whenever production problems arose, Loss Control meetings and inspections had to be cancelled. Thus, while the Loss Control approach tries to gain top management support for safety by merging the idea of safety with that of productivity, our survey shows that the attempt is only partially successful.

A related issue on which our findings shed some light is the importance of management style. First, it is clear in the cases we studied that only the firms which already employed a participative approach, or were able to change to such an approach, were very successful with their Loss Control programmes. Companies A and B were very authoritative, and consequently few Loss Control principles had been successfully implemented. Also, the critics of Loss Control who feel that the approach cannot work in South Africa because participative management is not suited to the nonwhite workforce, are refuted by the evidence from the other three companies, all of which employ large numbers of black workers. Our findings here are supported by other recent studies in the Western Cape: for example, a survey in the clothing industry showed that blacks resent a paternal or authoritarian approach, and want to play a greater role in making decisions affecting their work. (107)

Our test of the claim that Loss Control will be more effective than the injury prevention approach in lowering accident rates is inconclusive. The change to Loss Control did significantly reduce the injury frequency rates in Company C. No improvement occurred in Company A, but there the Loss Control programme had not progressed beyond the initial stages. In Companies B, D, and E, the frequency rates were already so low when Loss Control was introduced, that no significant improvements could be expected. Our evidence does, however, strongly support the claim that Loss Control greatly increases the reporting of

incidents to gain information about underlying accident causes.

Does Loss Control help to reduce the line-staff conflict that is characteristic of traditional injury prevention? Unfortunately, this is not directly testable by a survey of the type we conducted: a direct test would require a study of the attitudes of large numbers of line and staff personnel. However, our evidence does provide some indirect support for that claim, as several of the respondents said that Loss Control had noticeably helped to improve company morale. On the other hand, one of the reports suggests that the resentment which line supervisors have traditionally felt towards the staff safety specialist may partly be diverted to other directions, since in one company they strongly resisted a greater accountability for reducing losses. While our study shows that the cost accountant must have the major role in measuring losses in order for the Loss Control programme to obtain credibility, it is possible that he could replace the safety officer as the target of the line managers' resentment.

With regard to motivation, our survey confirms the claim that Loss Control, by employing job enrichment and trying to increase job pride, motivates workers better than the various methods employed by traditional injury prevention: in all of the firms with well-developed programmes the respondents agreed that the Loss Control approach was a definite improvement. Again, of course, a better test would be an extensive survey of employee attitudes in companies with Loss Control programmes.

Finally, in discussing the results of the survey we need to look at the predictions we made in the previous chapter concerning the applicability of Loss Control principles to South African conditions. We expected to find three main obstacles: the management style of most South African companies, the concern with production and a high rate of economic growth, and the shortage of management skills, especially on middle levels. We discovered from our survey that the first problem does exist, as we have already discussed, but three of the companies studied demonstrated that a shift of management style may be easier than we expected when making the prediction. Secondly, we found that the narrow attention to production and marketing represents an even more serious and widespread obstacle to Loss Control: few companies have developed Loss Control programmes, apparently because most higher managers associate the idea of Loss Control with safety and are not very interested; and in some firms with Loss Control programmes, production is treated as a separate concern and still receives most of the serious attention. Thirdly, our expectations about the effects of a shortage of qualified middle managers received only slight confirmation. In only one firm was it evident that the staff specialist lacked the ability to understand and administer Loss Control. In the other four firms, the staff specialists were able and respected men: this may indeed be one of the reasons why their companies are among the very few which have even developed Loss Control programmes. Except in Company C, where the respondent complained of a shortage of qualified line supervisors who could assist in

implementing Loss Control, this did not emerge from our survey as a major practical problem. However, if we had looked at some firms in which middle managers had wanted to adopt Loss Control, but were unable to get the approval of higher management, the overall picture may well have been different.

## CHAPTER SIX

### CONCLUSION

#### 6.1 THE PROJECT IN PERSPECTIVE

As a concluding note, we shall summarize our investigation of the Loss Control approach to industrial safety, mention how our findings could lead to further research on the subject, and discuss in the light of our study the future prospects for Loss Control.

We began by showing that the problem of reducing occupational accident rates is still a serious one in South Africa and other industrialized countries. Implicit in Marx's analysis of capitalism is a prediction that because of the conflict of interest between the managers of a business on the one hand, and workers on the other, progress in improving the safety and health of workers would be slow. We examined three attempts to refute this prediction: (1) the claim that industrial accident figures are declining at a satisfactory rate; (2) the argument that managers are generally willing to reduce the risks of injuries to their employees even when they believe this is detrimental to profits; and (3) the suggestion that the problem has been solved or greatly alleviated by the enactment and enforcement of government legislation.

With regard to the first claim, we demonstrated that while certain accident rates have decreased over the past several decades, the degree of improvement is hardly impressive, especially when one considers the effects of better medical treatment and the shift in the working population away from blue-collar, high risk occupations. Once these factors are taken into account, the contribution of the industrial safety movement is disappointing. Moreover, in many Western industrialized countries accident frequency rates appear to be worsening. In South Africa, while the trend is still slightly downward, the rates seem to be levelling off at an unsatisfactory level. Therefore, the claim that industrialists have made commendable strides in reducing the risks of accidents to their employees is contradicted by most of the evidence.

Secondly, we considered whether managers usually value their employees' welfare above increased profits, and cited the results of attitude surveys conducted by industrial sociologists, which indicate that humanitarian goals such as safety come near the bottom of the list of most managers' priorities.

Finally, we showed that the role of governments in protecting workers by means of regulations, inspectors, and legal penalties, has been unimpressive as well. Historically, most governments in Western industrialized countries have resisted enacting and enforcing legislation on industrial safety, a tendency which is

demonstrable up to the present day. In South Africa, as in other countries, the inspectorate charged with enforcing the Factories, Machinery and Building Work Act is grossly understaffed; and the numbers of successful prosecutions under the Act, along with the amounts of the fines when managers and companies are found guilty, are shockingly low. Thus, the claim that the problem of industrial accidents has been largely solved through government legislation cannot be maintained.

Recent concern over the thousands of people seriously disabled and killed in industrial accidents has led to attempted improvements in three major areas. First, while industrial safety has always been hampered by a lack of scientific research, serious work is now being conducted in fields such as ergonomics, psychology, and systems design to discover new accident prevention techniques. Secondly, in a few countries such as the United States and Great Britain, significant changes are being made in government legislation. Finally, since the 1960's there has emerged a new business management approach called Loss Control, which promises to be more effective than previous methods in bringing accident rates down.

The main objective of the present investigation was to evaluate Loss Control in both theory and practice. By obtaining information from firms employing Loss Control techniques, it was also hoped to determine whether the new approach is suited

to South African conditions, whether companies here would be advised to adopt it, and if so, how they should go about it and what possible mistakes they should avoid.

In order to comprehend Loss Control and the arguments for and against it, it is necessary to understand the present approach to safety, which Loss Control is intended to replace. We showed that while actual safety programmes differ considerably, they share a number of basic features, which define what we termed the "traditional injury-prevention approach" to industrial safety. Traditional methods, which are still used by virtually all South African companies with safety programmes, are based on two main assumptions: (1) that accidents are best prevented through a special programme to study actual and potential injury cases, determine causes, and devise remedial measures; and (2) that a major emphasis should be placed on developing "safety consciousness" among workers, whose unsafe acts are the primary causes of most accidents. The first assumption engendered a policy of having someone in a staff position perform special activities such as conducting safety inspections and investigating accidents; and it also led to the practice of measuring success or failure by injury frequency and severity rates. Acting on the second assumption, companies have aimed at the workers various special motivational devices, many of them similar to advertising gimmicks used to sell products. Special safety training courses are given, mainly to the levels of foreman and below, and the

safety programme is designed to give the active role to the workers and first-line supervisors, while higher management provides relatively passive support in the form of verbal encouragement and financial backing.

We demonstrated, however, that the traditional injury prevention approach has many serious weaknesses. First, the appointment of a staff safety officer or safety committee usually adds to the line-staff conflict in the organization. The traditional type of staff position is seldom justified by a need for special expertise which line personnel do not possess or could not easily acquire; and in any case, most safety officers in South Africa are poorly qualified. Also, since accident causes form a subset of possible causes of inefficiency in most of the operations of the business, the major duties of the staff specialist to inspect, investigate, recommend improvements, etc., tend to duplicate the responsibilities of line managers to maximize efficiency. Consequently, line managers use the existence of the staff position as an excuse, regard it as an irritant, or both.

With respect to company internal reporting policies, we saw that the traditional concentration on actual and potential injury cases hindered progress, as larger numbers of incidents with the same underlying causes are ignored. Similarly, the use of injury rates as the sole or primary measurement of company or departmental safety performance was rejected:

they are not sufficiently accurate for this purpose, and their use often discourages people from reporting accidents. Other traditional measurements were also examined and found to be inadequate.

The second assumption inherent in the injury prevention approach, that most accidents are primarily caused by the workers themselves, was examined in detail and discarded as totally unscientific.

As the events identifiable as "the causes" of an accident depend upon variable factors such as the purpose of the inquiry and the investigator's point of view, there is no case for ascribing most accidents to workers' unsafe acts; and consequently, no argument can be constructed on that basis for assigning the active role in accident prevention to first-line supervision, and a relatively passive role to higher management. Finally, we found that the traditional motivational devices aimed at making workers more "safety-conscious," such as appealing to self-preservation, using competitions, prizes and bonuses, and encouraging participation through safety committees, have serious faults: many of them conflict with recent findings by industrial psychologists and sociologists, fail to harmonize with the management style of the company, or are nullified by other motivational devices intended to achieve higher production.

As an alternative to the traditional approach to industrial safety, we described the theory of Loss Control, and noted how it is designed to avoid most of the weaknesses of injury

prevention. Briefly, under the Loss Control approach, instead of being treated as a staff function safety becomes primarily a line function, with line personnel made responsible for inspecting, investigating, devising remedies for accident problems, and performing other activities formerly done by a safety officer or safety committee. As far as possible, safety is not regarded as a separate topic, but is subsumed under efforts to improve efficiency: thus, for example, safety committees are transformed into productivity or Loss Control committees, and safety training is fully integrated into the normal instruction on manual and supervisory skills. With regard to internal reporting practices, under a Loss Control approach employees must not only report injuries, but any type of incident with which investigation and corrective action would probably be worthwhile in reducing costs. The measurement of company and departmental safety performance is mainly in terms of (a) cost assessments, handled by the accounting section and matched with the regular financial reports, and (b) records of certain activities tending to reduce accidents, rather than accident or injury rates themselves. Finally, under Loss Control higher management is expected to take a more active role in accident prevention; and employee motivation at all levels of the organization does not take the form of any special appeals to work safely; instead, a reduction in accidents is one of the anticipated benefits of using job enrichment, developing job pride, and stressing efficiency and quality work.

In our survey designed to test the theory of Loss Control by studying the application of the new approach in various firms in the Western Cape, the evidence confirmed many of its alleged advantages over traditional injury prevention. On the other hand, it also pointed to several qualifications about the effectiveness of Loss Control, none of which have been admitted so far by its many proponents. Subject to these qualifications, we found that Loss Control can work under South African conditions, and our descriptions of some actual programmes, and the successes and failures which firms have experienced in developing them, could serve as a practical guide for any manager considering the adoption of a Loss Control system.

## 6.2 THE NEED FOR FURTHER RESEARCH

The investigation we conducted plainly showed a need for further research. First, as only a few firms in the Western Cape were found to have Loss Control programmes, the same type of survey could be carried out over a larger geographical area (and perhaps extended to the entire country) to make the evidence more statistically significant. Secondly, a few of the theoretical arguments in favour of Loss Control, such as the claims that it ought to reduce line-staff conflict in an organization, and that it develops better attitudes toward safety in workers and managers at all levels, are not directly testable by a survey of the type we devised, in which information is obtained from one respondent in each firm. One could shed further light on our findings by employing

questionnaires designed to test attitudes in much larger selected populations. Of particular interest would be : (1) an assessment of attitudes and opinions among managers who have heard about and understood Loss Control but have decided not to adopt it, to discover the reasons why; and (2) a survey covering large numbers of workers and managers in firms which have switched to Loss Control, to see whether the expected benefits in changing attitudes and improving motivation have actually occurred.

### 6.3 PROSPECTS FOR LOSS CONTROL IN THE FUTURE

In the course of our inquiry, when comparing Loss Control with the traditional injury prevention approach to industrial safety, our comments about the new technique were predominantly favourable. However, our findings also point to a serious doubt concerning the effectiveness of Loss Control which we have not previously discussed.

As we observed in Chapter I, since the Industrial Revolution the problem of occupational safety has always seemed to involve a conflict, real or apparent, between two social values: (1) the demand for production and economic growth, to raise the living standards of everyone in society; and (2) the demand to protect workers from the risk of accidental injury. The problem would be less acute if the individual's benefits from increased production were directly proportional to the risk incurred in his job; but unfortunately, it is obvious that the

benefits are in general in inverse proportion: the people who have to accept high-risk occupations are usually in the lower economic categories.

With its emphasis on preventing injuries, the traditional safety approach has always relied heavily on appealing to managers' sympathies or altruistic principles, on the basis of item (2) above, to prevent their workers from being hurt; and as a secondary appeal, the claim has been made (with less than complete success) that safety is also financially good for the business. Under the Loss Control approach, however, the emphasis is shifted almost entirely to the productivity aspect, while the humanitarian appeal for injury prevention virtually disappears from the scene: the manager is told in effect that he can retain and even intensify his narrow interest in raising production and lowering costs, since one of the consequences of pursuing these goals will be a drop in the injury rate. In the words of Bob Wright, a Canadian Loss Control expert :

Loss Management is not simply another name for a safety programme, but is a deliberate and dramatic departure from the emotional approach to personal injuries towards a hard-nosed pragmatic approach to the conservation of both people and resources.

We take better care of our people by taking better care of the business.<sup>(108)</sup>

In addition, Bird and Loftus suggest that by increasing profits, companies will naturally improve safety with the extra money

to do so :

By utilizing available resources properly, management has more resources to utilize and, in effect, more money to spend on the needs of people, their safety and health. (109)

But we need to ask, where is the evidence for these claims? Anyone who is familiar with industrial safety in practice will recognize that the suggestion of Bird and Loftus is patently false: in most companies, managers do not automatically decide to allocate more money for safety whenever profits have gone up: the relationship is not that simple. The more interesting argument, because it forms the keystone of the entire Loss Control approach, is the one made by Wright and by other proponents of Loss Control, that safety and productivity always go hand in hand.

Our study has demonstrated that because accident causes form a subset of possible causes of operational inefficiency, efforts to improve productivity will indeed go a long way towards lowering accident rates, probably further than most managers ever realized. But are the advocates of Loss Control justified in neglecting the humanitarian approach, and suggesting that the apparent conflict between production and safety is really an illusion?

The claim that what is good for the safety of employees is also good for the business is strongly reminiscent of the assumption

made by the proponents of job enrichment, such as Herzberg and McGregor, that efforts to provide workers with more interesting and satisfying work will always benefit the firm financially. In both cases, Loss Control and job enrichment, the key assumptions are largely accepted as articles of faith. And just as many tests of the latter theory have revealed limitations to the financial advantages of job enrichment, one could expect a similar fate for the underlying assumption of Loss Control. While the possibility of conflicts arising between safety and productivity is seldom discussed in articles on Loss Control, it is admitted by Fletcher's trade-off graph, discussed in Chapter IV: spending money on safety must eventually reach a stage where it is no longer cost effective. When that stage is reached, the Loss Control appeal will begin working against the interest in improving safety, rather than for it.

Thus, while Loss Control is designed to get the support of top management by exploiting their primary interest in production and profits, there is a danger that after the initial stages this approach could succeed too well: the manager who is encouraged to forget about humanitarian values and concentrate on productivity could be led to make "hard-nosed" decisions to sacrifice human lives for the sake of saving the company money. This is not to suggest that a decision of this kind is undesirable -- it is often in fact inevitable. But the trouble

is that a manager's estimate of when it becomes too expensive to save lives is likely to be considerably lower than the estimate of the workers who incur most of the risk; and the latter seldom have a voice in reaching the decision.

In conclusion, therefore, although Loss Control does promise to be more effective than traditional injury prevention in lowering industrial accident rates, one must recognize its limitations.

Where there remains a conflict of interest between workers and managers, the only solution would seem to be government intervention, as some countries are now beginning to realize.

In Britain, for instance, between 1970 and 1972, a committee under the chairmanship of Lord Robens examined safety legislation and enforcement policies, and found them to be inadequate. As a result of the committee's recommendations, a new Health and Safety at Work Act was passed in 1974, making radical changes from the previous Factories Act. Under the new system, the responsibility for ensuring that firms protect the health and safety of employees is largely shifted away from government inspectors and given to employee representatives elected from members of the trade unions, whose demands can be enforced under the law. A similar scheme is also in operation in Sweden. (110)

In the United States, concern over the apparent worsening of the industrial accident problem led to the enactment in 1970 of a new Occupational Safety and Health Act, which retained the traditional type of regulations and enforcement, but included stricter standards, greater numbers of inspectors, and far

heavier penalties for infringements. In South Africa, it would also seem that in order to bring industrial accident rates down to a more acceptable level, more companies will have to adopt modern, more effective techniques, such as Loss Control, and the present system of legislation and enforcement will have to be changed.

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