

THE INCENTIVE TO ACCIDENT PREVENTION

By A. BURGERS*

Safety is a sign of industrial well-being — of management efficiency and economic stability.

To promote this state of well-being it is necessary to remove the affliction of occupational accidents and industrial diseases.

It is surprising that it should still be necessary in our present day and age actively to campaign against the needless waste of effort, time, money and resources, not to mention pain, suffering and loss of life, which are the results of occupational accidents. Nevertheless, that is precisely the situation which confronts those who are engaged in accident prevention.

It may be that the term 'accident' is responsible for this attitude. It does rather suggest that such an occurrence is something which one cannot prevent, whereas in truth it is an occurrence which is unplanned. Once this is accepted it is an easy step to the idea that planning can reduce accidents. This is the message that those engaged in this work are trying to put across, whether they be plant engineers legally charged with the safety of machinery, pressure vessels, etc., or enlightened management or associations set up for the purpose, such as the National Occupational Safety Association.

In industry no group is free of this tendency to accept the accident as something to be borne with fortitude; this includes management, technical staff, and the worker.

It has been held that something like 88% of industrial accidents are due to human failure of one kind or another associated with some physical condition which made the accident possible.

The fact that the human factor is an element in the majority of accidents provides an excuse for inaction on the part of others in that it is often difficult to see what can be done to obviate the inattention, disobedience, irresponsibility, and thoughtlessness which so often contribute to the occurrence of accidents.

The Magnitude of the Problem

Should occupational accidents really receive more attention? Is it such a big problem?

If the annual statistics published by the Workmen's Compensation Commissioner are examined, it will be observed that in South Africa, including South-West Africa, some 220,000 occupational accidents resulting in injury occur every year and that the figure keeps on rising steadily year after year.

The thought of 220,000 people being injured, maimed and killed brings forth pity, remorse. The fact that some 30,000,000 man-days are involved, lost to productive work by injured people alone, makes one realise how seriously it affects the national economy — 120,000 people, many highly trained, permanently off work.

Perhaps it will be better to view the problem from the financial angle. Accident costs consist of both *direct* and *indirect* costs.

The *Direct Cost* covers medical expenses and compensation payments. These payments are made by the State Accident Fund, administered by the Workmen's Compensation Commissioner and subscribed by employers.

The *Indirect Cost*, often referred to as hidden cost, is not normally covered by insurance and although it varies from industry to industry is accepted to be at least *four times* as much as the direct cost. The indirect cost includes:

1. Cost of Lost Time by other employees who stop work:
 - (a) out of sympathy;
 - (b) out of curiosity;
 - (c) to assist the injured party;
 - (d) for other reasons directly connected with the accident.
2. Cost of time lost by Manager, Foremen, Section Head and other executives.
 - (a) assisting injured party;
 - (b) investigating the cause of the accident;
 - (c) taking witnesses' statements;
 - (d) arranging for the production to be continued by another employee;
 - (e) selecting, training, breaking-in a new employee;
 - (f) preparing official accident reports and attending before State Officials at inquiries.
3. Cost of maintaining First Aid Department.
4. Cost arising from damage to:
 - Machinery;
 - Tools;
 - Buildings or other property or the spoilage of raw materials or finished products.
5. Incidental cost due to interference with production; failure to fill orders on time, loss of bonuses. Payment of forfeits and other similar items.
6. Cost to employer under employee welfare and benefit schemes.
7. Cost of continued full pay to employee after return to work — although the employee may for a time be incapable of maximum output.
8. Lost profit on the normally productive time of those whose work has been interrupted and on idle machines.
9. Cost of lowered output through weakened morale of other employees.
10. The overhead cost per employee (continues in absence of employee).

There are additional factors which may be applied for specific industries or companies and which could well receive attention. The list does, however, clearly

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outline the vicious and seemingly endless cycle of events that follow in the train of accidents.

The average cost of an injury accident based on figures supplied by the Workmen's Compensation Commissioner and the accepted direct indirect cost ratio of 1:4 comes to

Direct Cost	R50
Indirect Cost	R200
Total	R250

The national annual loss due to 220,000 occupational accidents is R55,000,000.

Accident Cost Rate in the Sugar Milling Industry

Examination of Workmen's Compensation figures obtained a few years ago revealed that the sugar milling industry paid approximately R290 in Workmen's Compensation Insurance Assessments per 100 employees, that .9% of mill employees experienced injury accidents and that the direct cost was in the vicinity of R284 per 100 employees.

When the indirect cost ($R284 \times 4 = R1,136$) is added the seriousness of the position is obvious.

It is accepted that the position has improved, but it is questionable whether sufficiently to bring down the assessment rate which is now R1.25 per R100 wages.

Benefits from Accident Prevention

Apart from the prevention of pain and suffering a reduction in the accident rate reduces production cost not only by the amount involved in indirect cost but also by an improvement in efficiency brought about by the methods introduced to prevent accidents. An overall reduction in the accident cost experience in any particular sub-class of industry will allow the Workmen's Compensation Commissioner to reduce the assessment rate for that sub-class while the individual employer who successfully reduces the accident cost experience of his mill will receive triennial merit rebates ranging from 2½% to 50% of his Workmen's Compensation Assessments.

With the present acute shortage of labour the prevention of accidents has become a matter of utmost importance of a national character.

Cause and Prevention

An accident is an unplanned event which interrupts production and may involve personal injury. The injury is the end result of a sequence of events and may be prevented by breaking the sequence at any stage before the injury occurs. The following components constitute the essential parts for the production of an injury:

1. The Person;
2. The unsafe act;
3. The unsafe condition;
4. The accident;
5. The injury.

To prevent the person becoming involved in an accident in order to eliminate the chance of an injury a suitable person is selected for the particular job. This person is trained to perform his work in a safe manner while unsafe conditions are looked for and corrected.

The successful safety programme is based on the so-called "hazard through track" which provides for

- (1) A Safety Officer, Safety Committee or Responsible Person;
- (2) Knowledge of probable or potential hazards;
- (3) Knowledge of actual or existing hazards;
- (4) Selection of remedy for the named hazards;
- (5) Application of the remedy.

I

The first step is to organise by appointing a Safety Officer and/or a Safety Committee.

In terms of Regulation C7(2) of the Factories Act it is advisable to appoint *all* foremen to assist the person charged with the supervision of machinery (Certificated Engineer) by reporting to him in writing unsafe conditions and unsafe acts in Departments or sections in their care. These foremen should then serve on the Safety Committees. Apart from certificated engineers only two mills have to date appointed part-time Safety Officers.

II

Knowledge of Probable or Potential Hazards

Unless those responsible for safety have a knowledge of probable hazards which may exist or develop in their particular section of the mill they will not readily observe such hazards. Knowledge can be acquired by attending NOSA Safety Training Courses and from literature which is also available from NOSA Library.

III

Knowledge of Actual or Existing Hazards

This is acquired by methodical plant inspections, by investigation of accidents and by perusal and analysis of accident records.

IV

Selection of Remedy

Selection of remedy to correct the existing hazard or performance of unsafe acts may be one of the following:

- (1) Engineering revision such as guarding, changing, isolating, etc.;
- (2) Persuasion, appeal, instruction;
- (3) Personnel adjustment — changing personnel to more suitable jobs;
- (4) Discipline.

V

Application of Remedy

Process for the application of the remedy selected is put into operation.

Participation in the NOSA 'Safety Effort and Experience' Competition as a Means to Effective Accident Prevention

The S.A. Sugar Millers' Association has presented a floating trophy for competition by the Natal Mills.

The rules of the NOSA Safety Effort and Experience Competition which apply in this competition have been so designed that compliance ensures the introduction of effective safety programmes.

Certain definite objectives are set — none beyond the reach of good management.

As its name implies the competition is conducted in two parts: the one covering the Effort which a firm puts into its safety arrangements; the other, its improvement in accident Experience over a definite period of years.

A. Effort

Each mill will strive for the optimum standards of safety possible in its own particular circumstances. The main criterion of the competition and basis of judging is:

How much more could Management Reasonably be expected to do in a Specific Mill

Upon this question the whole competition hinges. This factor allows each competitor to be judged against his own previous best performance. Mill A, employing 10,000 workers will strictly speaking, compete only against Mill A; or again, Mill B, employing 125 workers will compete only against Mill B.

Thus, in the same competition, we have large and small plants attempting to secure the optimum standard for their own particular works. The five principles of good management to be tested by the competition are:

1. Delegation of Responsibility

By placing the responsibility for safety on certain members of the staff, an obligation to prevent accidents is created and given to a specific individual or group.

2. Organisation

The machinery of accident prevention must fit as a working unit into the framework of managerial policy, with formal channels for reporting progress, e.g., checking on portable electrical equipment.

3. Target Setting

As with salesmanship, it is necessary in safety to set certain targets, e.g., the safety board showing the number of days worked without a lost-time accident, plus the previous best effort.

4. Co-ordination

Safety is never a 'one-man' affair. No single person can stop accidents unaided; only with the full co-operation of the entire works staff can results be expected. Hence the establishment of safety committees to act as channels of communication and co-ordination.

5. Control

The optimum requirements of safety for each factory cannot be strictly defined. After all, at what stage in a factory's growth does management change from the informal discussion of safety matters at production planning meetings to a fully fledged safety committee with all the trappings of agendas and minutes?

Here the NOSA Regional Organiser must guide and advise individual Mill managements.

B. Experience

This section of the competition is based on the principle of all plants comparing their frequency rates for the competitive year with those of the last one or two years. These rates are then compared with that for the Sugar Milling Industry.

Mills will be assessed according to the following formula:

The maximum points for this part of the competition will be 100, calculated as follows:

$$\text{Experience} = \frac{100 - \text{Current Frequency Rate} \times 100}{\frac{\text{Past Frequency Rate} + \text{Industry Frequency Rate}}{2}}$$

$$\text{Frequency Rate} = \frac{\text{No. of Lost-Time accidents}}{\text{No. of Man-hours}} \times \text{One Million.}$$

Lost-Time Accident = is any injury or occupational disease, arising out of employment, and resulting in the afflicted person not reporting for work at one or more shifts OTHER than the shift during which he was injured.
e.g. If a person is injured at 10 a.m. on a Monday, goes off for the rest of the day, but, returns to work on the following day (Tuesday) it is not a lost-time accident.

Industry Freq. Rate: This will be calculated for the industry as a whole.

Note: The Competition will not be judged on experience until all the mills submit the number of lost-time accidents recorded each month to the NOSA regional office, plus the total number of man-hours worked (at a rough estimate each man works about 200 hours a month).

In *summing up* it may be as well to reiterate the main points made in the paper:

- (1) An accident is an occurrence which is unplanned but can be avoided.
- (2) Although self preservation is instinctive, positive thought and action is necessary to arouse this instinct in the worker.
- (3) The benefits derived from positive accident prevention measures in reducing operational cost and improving efficiency warrant active interest at all levels.

(4) The basic steps to introduce an effective safety programme are:

- (a) Organise — appoint personnel;
- (b) Acquire knowledge of hazards;
- (c) Find existing or possible hazards;
- (d) Select suitable corrective measures;
- (e) Eliminate hazards and correct unsafe methods and acts.

(5) Participation in the NOSA Safety Effort and Experience Competition will bring to light any weaknesses in the Safety Programme and competition results can be used as a yardstick to measure Safety Efficiency.

In conclusion there is no doubt that the effective safety programme, the clean, well kept and properly run plant reflects management efficiency and interest in the individual.

In addition to the sense of achievement and pride, responsible management will be satisfied that should an accident occur and a worker is injured or maimed, nothing that could have been done to prevent the occurrence was left undone.

Mr. Cargill: Now that the agricultural worker is covered by the Workmen's Compensation Act, are his man hours and safety record going to count in the N.O.S.A. safety competition?

Mr. Burgers: Not at present because the competition is judged on effort and experience. It is easy to judge experience in the field but not effort. But in a few years time it may be possible to include the field worker.

Dr. Dodds: It has been my experience that the more dangerous an industry the more care is taken and consequently accidents are fewer.

I worked in an explosives factory in Ireland for two and a half years and apart from a small explosion in a laboratory there were no other accidents.

I also worked for thirteen years at the Umbogintwini explosives factory and the experience was similar.

Everyone was aware of the hazards of a large explosion and as a result seemed to avoid having them on any scale at all.

I notice in sugar factories in Louisiana and Cuba that not as much care was taken as in the explosives factories.

Mr. Burgers: For an accident you must have an unsafe act and unsafe conditions. A factory may bristle with hazards and yet never have an accident.

But we cannot say that under any set of circumstances a man will never perform an unsafe act. His reactions are too unpredictable.

Machinery accidents are usually far more severe than other types and consequently machines should be properly guarded and places of work made as safe as possible.

Mr. Frost: I would like to emphasise that accident prevention must be extended to the agricultural side.

There was a time when very few thought an inspector was interested in an accident in the field and very few were reported so we do not know that the situation was like.

But there has been a change in outlook over the years which is very pleasing. You cannot prevent an accident if you cannot carry out investigations and obviously you cannot do so if the accidents are not reported.

Mr. Burgers says on page 2 that it is advisable to appoint all foremen to assist the Certificated Engineer charged with supervision of machinery but in fact this is a compulsory provision.

Mr. Burgers: The Act says at least one foreman must be appointed but my advice is to appoint all foremen. It is a good thing to have each departmental foreman taking an interest in accident prevention to ensure that the whole factory area is covered.

Mr. Gunn (in the chair): Mr. Burgers says one of the biggest factors to contend with is the human element. He then goes on to say that we must take the workman and put him on a pedestal. I think this must surely be regarded as an unsafe act.