INDUSTRIAL SAFETY AT TSB MALELANE

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Abstract

Safety is of paramount importance in any industry and the success of any accident prevention programme is dependent on the extent to which it is managed. During 1983 the TSB factory launched an intensive safety programme, the results of which are discussed.

An attempt was made to quantify the financial impact made by the overall improvement in the safety situation since the start of the programme. A detailed analysis was done with relation to the safety statistics gathered during 1987. Recommendations for further improvement are also discussed.

Introduction

Safety forms as important a facet of management as any other. Unsafe practices are often of such a nature that death or serious injury could result. Safety management forms an integral part of management's tasks and cannot be regarded as separate or optional.

Safety must be carefully and correctly delegated according to the regulations laid down in the Machinery and Occupational Act, Act number 6 of 1983 as amended. This act defines minimum safety standards which, if they are met, should result in a safe working environment. However, the act in itself will not achieve the desired results, if the attitudes of both employer and employee are not susceptible to continuing routine safety measures.

The success of any accident prevention programme is largely dependent on the extent to which it is managed. Measuring and evaluating results on a continuous basis are essential. As far as industrial safety is concerned, the TSB sugar factory and sugar estates are managed as separate entities, because of the vast differences in working environment as well as in employee attitude and aptitude.

TSB head office is situated on the same site as the factory and head office statistics are thus included in those used for the factory. Although some of the sections in head office are also handling estate affairs, it is not possible to differentiate between these figures.

Table 1 compares relevant details of the TSB sugar factory, the estates and the cane transport section.

Safety Programme for the Factory

Measurement definitions

A disabling injury (DI) is a work related injury which results in an employee going off duty for one or more shifts other than the one on which he was injured. All injuries where bone damage or fracture occurs are considered to be disabling injuries.

The disabling injury frequency rate (DIFR) expresses the number of disabling injuries sustained for every million man-hours worked.

$$\text{ie DIFR} = \frac{\text{Number of DI's} \times 10^6}{\text{Total number of man-hours worked}}$$

The DIFR is calculated over 12 months.

Factory Safety

Prior to 1983 an average of 50 DI's (representing a DIFR of more than 15) were recorded per annum. National Occupational Safety Association claims present day uninsured cost per injury to be at least R1 000 in the form of make-up salary, hiring and training replacements, investigation time, administration costs, etc. Taken at this cost of R1 000 per injury and applying Bird's formula for accident ratio of 1 DI to 10 other less serious injuries, the estimated uninsured cost was in the vicinity of R500 000 per year.

During the second half of 1983 TSB started an intensive safety programme based largely on the NOSA MBO system.

- A full time safety co-ordinator was appointed.
- The safety co-ordinator received special training in industrial safety management techniques.
- Statistics were gathered regularly and analyzed.
- The company safety policy was determined by top management and served as the basis upon which safety objectives were set.
- An internal safety training programme for all employees was started.
- Safety representatives and safety committees were appointed and launched.
- All accidents that caused injuries needing treatment in the plant first aid room were properly investigated, the causes were determined and preventative action taken.

Table 1

TSB characteristics for 1987

Characteristics	Factory		Estate (10 756 ha)		Cane Transport	
Main product	Refined sugar		Sugarcane		Cane transport	
Secondary product	Cattle feed		Citrus		–	
Total No. of employees	1 254	100%	1 896	100%	101	100%
Management	19		6		1	
Head office	74	11,5%	9	1,7%	2	3,9%
Supervisory Estate/factory	51		17		1	
Artisans	85	6,8%	28	1,5%	8	7,9%
Non artisans & labourers	1 005	80,1%	1 740	91,8%	24	23,8%
Drivers	20	1,6%	96	5,0%	65	64,4%
Total hours worked	3 284 324		4 230 627		303 872	

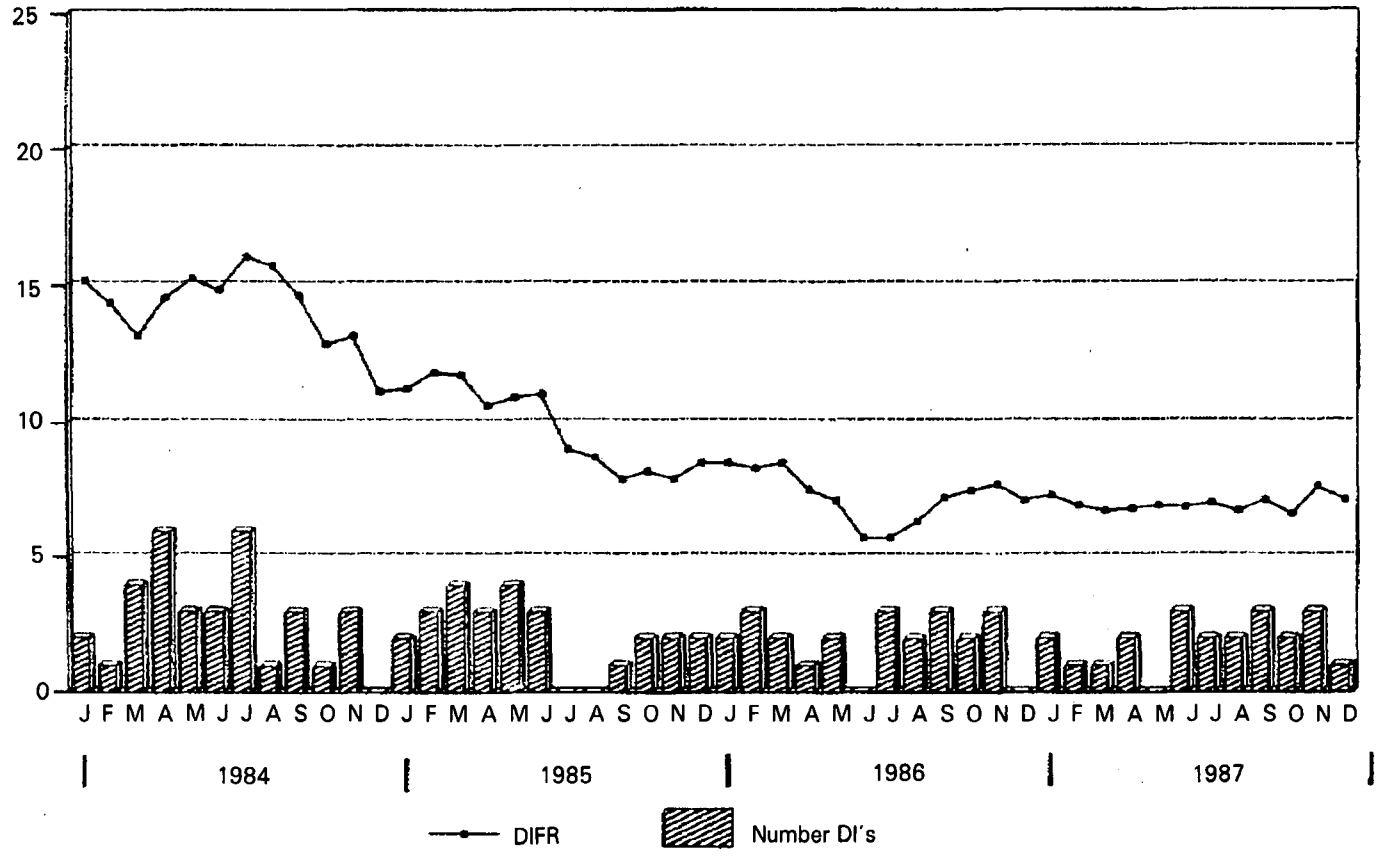

FIGURE 1 DIFR: TSB Factory 1984 to 1987.

- Safety was propagated among all levels of employees, and interdepartmental competitions were introduced.
- Top management together with line managers were directly involved in the safety programme. Nobody was allowed to shirk his responsibilities.
- NOSA was requested to include the factory in their star grading system.

At the beginning of 1984 the factory had a DIFR of 15 (Figure 1). The first positive results on the newly introduced safety programme evolved during the second half of 1984. A slow but steady improvement set in and continued till September 1985, when the DIFR levelled out at between 7,8 and 8,4. For the year ending december 1984, 33 DI's were registered, costing an estimated R330 000 in uninsured costs – amounting to a 34% saving during the first year.

In December 1985, 26 DI's had been registered for the year. This represented a total improvement over two years of R410 000 saving in uninsured costs.

During the years 1983 and 1984 it was observed that certain non-serious injuries on duty were not 'managed' ideally. Loss of control and poor co-operation between line management and company medical staff, resulted in some of these cases becoming disabling injuries. These organizational problems were sorted out by appointing additional paramedical staff, as well as by establishing overnight medical facilities. Every injury on duty was carefully treated and monitored. Strict control was kept over the patients' movements.

Further improvement in the DIFR was again experienced. The decline in injuries started in February 1986, and eventually reached an all time low on 5,6 in May the same year. In July 1986 the DIFR rose to a level of between 6,5 and 7,5 where it remained until the end of the study period, December 1987.

The main reason for this slight increase can be attributed to certain staff changes, which took place in the medical department during July 1987 and caused a weakening of control over post-injury treatment and patient movement.

The safety programme which was initiated in 1983 resulted in an estimated total saving of R910 000 over a period of four years.

Setting Even Higher Objectives

Reaching and maintaining a DIFR of between 6,5 and 7,5 was already a considerble improvement on the original 15. However, when TSB safety achievements were compared with those of other sugar producing factories it became evident that even better results can be attained. In order to improve the DIFR further, a more detailed analysis was undertaken. The records of disabling injuries for 1987 were used to determine the various causes, types of injuries, part of the body affected, and departments where most DI's occurred as well as the time lost due to injury.

Figure 2 indicates lost time per part of the body injured, and Figure 3 the lost-time per type of DI, expressed as a percentage of lost-time for 1987.

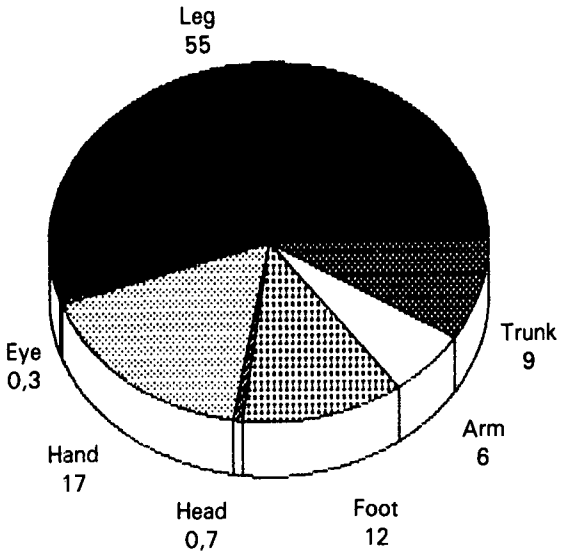

FIGURE 2 Factory lost time 1987. Percentage per part of body injured.

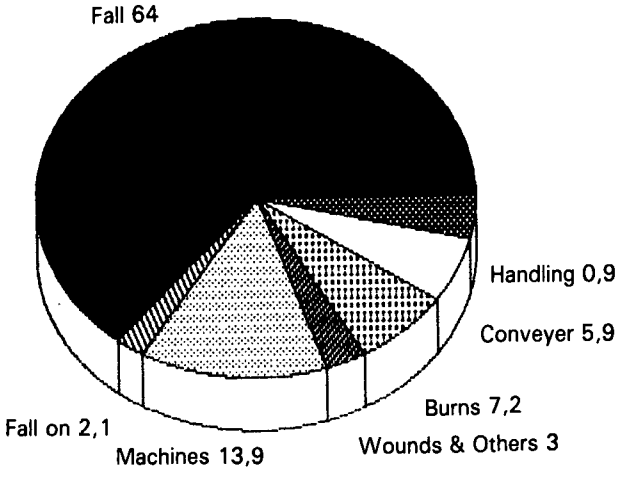

FIGURE 3 Factory lost time 1987. Percentage per DI type.

The seriousness of an injury caused by an accident is variable, and when accident prevention measure are being investigated, time lost due to disabling injuries should not be considered.

Table 2 indicates the 1987 DI's for the factory.

In 36% of the DI's the injury was inflicted upon the main part of the body (trunk). Foot injuries were the next highest at 20%. Although those parts of the body were involved in 56% of all DI's, they were not the serious type, and represented 9% and 12% respectively of the total time lost due to DI's.

Bruises and sprains were the type of injury experienced most frequently; 45% of all DI's were of this nature. Cuts and burns were second on the list with 16% each. Bruises and sprains were also not of a serious nature and accounted for 11% of the total time lost.

Disabling injuries were mainly caused by falls and represented 36% of the cases. A case of body or limbs caught between machines and/or equipment was the second highest cause of DI's, amounting to 12%.

Figure 4 indicates the percentage contribution of the various work areas towards the total DIFR as registered for 1987. (DIFR × 6,9).

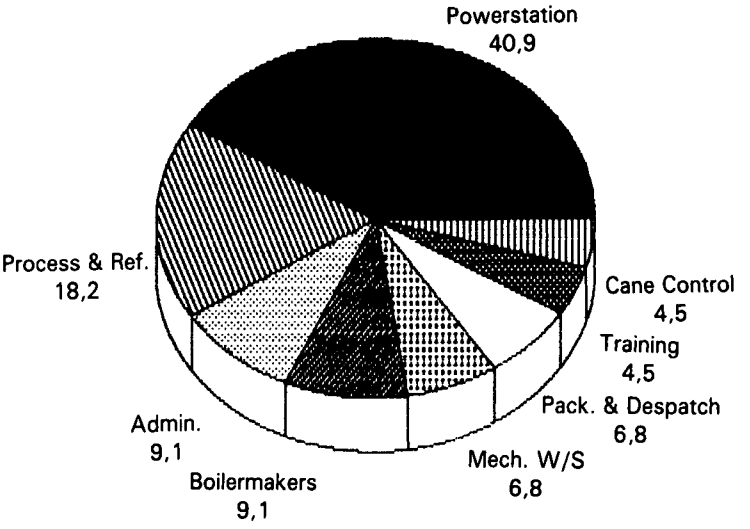

FIGURE 4 Factory 1987 percentage contribution to DIFR.

Disabling injuries that occurred in and around the power station contributed 40,9% towards the total DIFR, while those that happened in the process department added a further 18,1%.

Statistics in relation to the seriousness of DI's indicate the following:

- DI's causing absenteeism of less than 4 days represented 40% of the total.
- DI's causing absenteeism of 4 to 13 days represented a further 40%.
- 10% of DI's occurring in the factory could be classified as being of a very serious nature.

Other indications are:

In TSB's case it was found that the power station area represented the highest risk area to IOD's. This is completely out of line with the experience of other sugar factories.

Table 2

1987 DI's: As percentage of total injuries in the factory

DIFR	Part of body injured		Type of DI		Cause of DI	
7,0	Head	4%	Fatal	0%	Fall: off or against or on	36%
	Eye	4%	Bruises + sprains	45%	Moving machines: caught between	12%
	Arm	4%	Burns	16%	Object fall on/against person	8%
	Hand	8%	Cuts	16%	Wounds by foreign objects	8%
	Finger	12%	Fractures	12%	Handling of heavy material	8%
	Trunk	40%	Amputation	8%	Moving conveyor belts	4%
	Leg	8%	Snake bite	3%	Burns: hot ash	4%
	Foot	20%			cooking oil	4%
					chemical	4%
					open flame	4%
					arc eyes	4%
					Snake bite	4%

66% of these injuries could be considered as less serious DI's (less than 14 days off duty) while 44% of persons injured were off duty for between 2 and 4 days.

30% of the total slight DI's also originated in the power station. The remaining 70% were distributed fairly evenly among the other 7 departments.

The authenticity of "bruises and sprains" inflicted on the main part of the body cannot be easily verified. The necessity to book off duty for a short period of 2 days only, can often be regarded as highly questionable.

In evaluating the above information it was clear that:

- The main cause of accidents responsible for DI's in the power station area could be attributed to unsafe acts which in turn could be related to the human factor, best described as lack of motivation and attitude of the employees in this department.
- One of the most important aspects in the quest for total prevention of disabling injuries, is taking active steps to ensure that the injured do not absent themselves from duty, thus increasing the loss-time factor and adversely affecting the DIFR.

This absenteeism can only be reduced by line management applying strict discipline, to ensure that they monitor every case closely, in order to ascertain that the injured person receives continual attention from the medical staff. This is particularly necessary where employees do not live on company property.

Conclusions

Because productivity and safety go hand in hand, TSB's safety objective is to achieve and maintain a DIFR of between 3 and 4. In the next phase which is being initiated, more attention will be given to:

- Motivating employees through appropriate training programmes.
- Raising the standard of interdepartmental competition as well as increasing the reward for the winning department.
- Reviewing standing job procedures with the accent falling on safer ways to carry out the task.
- Reducing accidents and particularly lost-time accidents through the total involvement approach.

Further, in view of the very large number of persons employed in the sugar industry as a whole, it is believed that the time has come for the establishment of an industry safety programme culminating in an annual competition possibly organised by NOSA.