SAFETY MANAGEMENT - A NEW STRATEGY FOR IMPROVED INDUSTRIAL PERFORMANCE

By

Letisia. M. Warioba

ABSTRACT

Safety management is probably not a very young profession. The role of any safety professional is to identify how and why accidents happen and to suggest control measures to limit their happening. Safety management describes how to establish and implement a safety function at an enterprise level.

This paper, attempts to (a) give a background information on safety management (b) list down the principles of safety management, (c) point out the importance of safety management, (d) explain Accidents implication to industrial performance and (e) suggest some control measures.

This will be done by taking Morogoro Canvas Mill, in Tanzania and Foundary and Machine shop in India as case studies.

INTRODUCTION

Lifting equipment for example a fork lift, that is not properly maintained and inspected annually, can be very dangerouns. A heavy load

---

Mrs L.M. Warioba is a Lecturer - Management and Public Policy at the Institute of Development Management (IDM) - Mzumbe

can cause many millions of shillings worth of damage, but more importantly, can kill many people unless the load is properly secured and the machines properly operated with the correct safety devices lifted.

The above point is demonstrated by R. Schuller and others (1986)' who give an example based in the United States of America (USA). They point out that each year in USA, an average of as many as 1,000 deaths and 6,000,000 lesser injuries occur in occupational accidents. At the same time as many as 400,000 new incidents of occupational diseases such as cancer, tuberculosis, asthma etc and as many as 100,000 workers die as a result of such diseases. The National Safety Council, USA estimates that the annual accidents and about $ 15 billion for occupational diseases. In addition to this $ 4 billion is paid to victims of job related diseases. Another $ 20 billion is lost due to lost productivity, cost of insurance, hospitalization and other medical expenses.

There is also the fact of lost lives, which cannot be measured.

Taking into account the enormous costs involved, both in terms of money and human, there is a need of improving occupational, safety and health, with the aim of reducing these costs. Take the listing equipment as an example. The fact is that, if the machine operator was properly trained, the probability of accident would have been reduced. If the machine was properly equipped with safe load indicator or load limiting devices, the operator would have known when the load was too heavy, and would have made other arrangements.

This would also benefit the owner, since the machinery will not be damaged by having to lift loads that are heavier than its capacity. As a result the machine will last longer, less

repairs, hence, increased profits.

1.0 WHAT IS SAFETY MANAGEMENT

1.1 Background Information on Safety Management

The safety function at an enterprise level started in 1900s. The first workers' compensation laws provided the financial atmosphere for industrial safety. The introduction of these laws marks the beginning of the first era in industrial safety management.

The reason behind it,being that the the management, through legislation found itself in a position of having to pay for injuries on the job. The management found that it was better to prevent the injury from happening. This saw the birth of industrial safety movement. In the early years the movement concentrated on the poor physical conditions that existed. Later on, the movement concepts included the "Unsafe acts" and "Unsafe conditions". Then the whole ideas of industrial hygiene was emphasized.

During 1960s, safety engineers started setting policies, defining responsibilities, clarifying authorities about industrial safety etc. It was during this period that the scope of safety management widened to include risk management techniques, total loss control systems etc.

In 1960s, safety professionals started to develop training programs. While the 1980s saw a thorough revision of occupational safety and health laws in many industrial countries.

The main purpose was on how to measure performance in safety and how to define managerial roles. It was during this time that the safety professionals started to look at people side of the safety problem.

They began to use the principles of safety management. Now, the question is what are the principles of safety management? Are they the same as the general principles of management? This is highlighted in the next section.

1.2 Principles of Safety Management

The following are 9 principles for a successful safety management:-

1.2.1. An unsafe act, an unsafe condition, and an accident, are all symptoms of something wrong in the system. The point here is that, many factors contribute to accidents. This include unchecked machines, poor working conditions, long working hours etc.

1.2.2. Once can predict that certain sets of circumstances will produce severe injuries. These circumstances can be identified and controlled.

According to this principle, one can predict severity of accidents under certain conditions and thus, turn the attention, to severity parse i.e. preventing its happening.

1.2.3. Safety should be managed like any other comkpany function. Management should direct the safety effort by setting

achievable goals and by planning, organizing and controlling to achieve them.

This principle equates safety with quality, cost and quantity of production. It also brings the management function into safety.

1.2.4. The key to effective line safety performance is management procedure that fix accountability. That is to say, any line manager will achieve results, in those areas in which he or she is being measured by management. The concept of "accountability" is important for this measurement, and lack of procedures for fixing accountability is safety's greatest failing.

A person who is held accountable will accept the given responsibility. In most cases someone who is not accountable cannot accept responsibility.

1.2.5. It is the function of safety officials to locate, and define the operational errors that allow accidents to occur. This function can be carried out in two ways:

(i) by asking why accidents happen, that is serching for their root causes and

(ii) by asking whether any known effect controls are

being used.

1.2.6. The cause of unsafe behaviour can be identified and classified. Some of the classifications are overload i.e. improper matching of persons capacity with the loan. Traps and the workers decision to error. Each cause can be controlled.

This principle suggests that it is the task of the management to identify and deal with the causes, of unsafe behaviour, not the behaviour itself.

This principal advocates that human error (unsafe behaviour) in involced in very accident and that there are many reasons behind this behaviour. It further suggests that these reasons can be identified and classified and are caused by specific things. Among the causes are:-

(i) by asking why accidents happen, that is searching for their root causes and

(ii) by asking whether any known effective controls are being used.

1.2.6 The causes of unsafe behaviour can be identified and classified. Some of the classifications are overload

i.e. improper matchsing of kpersons capacity with the load. Traps and the workers decision to error. Ealkch cause can be controlled.

This principle suggests that it is the task of the management to identify and deal with the causes, of unsafe behaviour, not the behaviour itself.

This principle advocates that human error (unsafe behaviour) is involved in every accident and that there are many reasons behind this behaviour. It further suggests that these reasons can be identified and classified and are caused by specific things. Among the causes are:-

(i) overload which is defined as a mismatch between worker, capacity and the load placed on him/her in a given state, and

(ii) traps that are left for the worker in the workplace e.g. slippery floors etc.

1.2.7. That, in most cases unsafe behaviour is completely logical and normal in human behaviour. It is the result of normal people reacting on their enviornment. The management's job is to change the environment athat lead to unsafe behaviour.

This principle suggests that, when people acty unsafely, they are not dump or careless, that they are not children, that need to be corrected and changed to make them "right". It rather suggests that unsafe behaviour is the result of an environment that has been constructed by management. It is comkpletely logical and normal to act unsafely.

1.2.8. That there are three major sub-systems that must be dealt witgh in building an effective safety system these are (a) Physical, (b) Management and (c) Behavioural.

The safety system kshould fit the culture of the organization i.e. the organization should strive for an open and participative culture in the organization, rather than, using a safety program which is directive and authoritatian, which does not work.

1.2.9 There is no one right way to achieve safety in an organization. For a safety system to be effective it must meet certain criteria.

The system must:

(i) Force supervisory performance.

(ii) Involve middle management.

(iii) Have emplloyer participation.

(iv) Be flexible

(v) Be perceived as positive.

The point is, the whole system must be constructed with behaviour soundness.

It is however important to note that, for a safety program to be successful the 9 principles listed above must be recognized and put into practice.

The question is: Why safety management? Why should employers follow the 9 principles of safety management? What will happen if an employer fails to observe them? These questions among other things, are answered in the next section.

2.0. WHY SAFETY MANAGEMENT

S. Kumar (1981)[2] points out that every year there is an increase of accidents in industries. This result to injuries and even death, to employees. As a consequence to this one might temporarily or permanently be disabled. He further argues that the money cost to the national economy due to compensations is very high.

This justifies the need to stop or prevent these unsafe practices. There is a need for industries, safety methods. The principle of any industry should be safety first, profits second and not otherwise. One wonders, as to what are the causes of accidents. Listed below are some of the cuases of accidents in industries.

2.1 **Causes of Accidents in Industries**

There are several causes of accidents. These include:

2.1.1 Unsafe mechanical or physical condition. This include,

(a) defective equipments i.e. tools and machines,

(b) improper ventilation and illumination and

(c) ineffective safety devices e.g. fire extinguishers etc.

2.1.2 Unsafe Acts - this is a violation of accepted safe procedure e.g.

(i) operating machine without authority,
(ii) using unsafe equipments,
(iii) not using protective devices, such as gloves, spectacles safe boots etc.
(iv) unsafe loading equipments,
(v) working on a moving

equipment.

2.1.3 Inadequate supervisors safety program. This include,
(i) safety instructions being inadequate,
(ii) safety rules not enforced,
(iii) safety not planned as part of the job,
(iv) safety devices not provide e.g. safety boots, spectacles, gloves etc.

In addition to accidents, there is also occupational diseases. Overleaf is the clarification of some of them.

Table 1: Occupational Diseases

Clarification	Type	Health Hazards
CHEMICAL	Dust & fumes	Respiratory problems e.g. Lung and other carcinomas (causes cancer)
	Lead	Systematic poisoning
	Gases	Systematic poisoning
PHYSICAL	Noise	Noise induced hearing loss Increased blood pressure Increased heart rate
	Illumination	Visual acuity problems accidents, headaches, etc.
	Temperature	Heat rash, heat stroke, systematic failures & brain damage.
	Vibration	Sleepiness, motion sickness.
	Ventilation	Poor indoor air quality leading to headaches, absenteeism, etc.

BIOLOGICAL	Bacteria virus, fungi etc.	Intake of hazardous substance through eating and drinking in the work environment: Bacteria, viruses, and fung encountered during the cause of work.
PSYCHOLOGICAL	Occupation that might endanger mental health e.g. air Traffic controllers.	-neurosis due to overloading of sense. -uncoordinated basic, strict supervision etc. could cause mental stress. -could lead to absenteeism tiredness, sleepiness, heat disorders, peptic ulcers and asthma.

Source: Safety Management Journey Pretoria - S. Africa April 1994

Having discussed some of the causes of industrial accidents their implications to industrial performance are analysed in the following section.

3.0 **ACCIDENT IMPLICATIONS ON INDUSTRIAL PERFORMANCE**

An accident is defined as un intended occurance arising out or connected with plant operations that hinder efficient operation of the system, be it an industry or any operational organisation.

3.1 As pointed out by Kumar (1981), accidents lead to person injuries, production delays, decreased production, damage to property involved in the accident.

3.2 Other losses due to accidents include:

(i) Workmens Compensation. This is an insurance premium paid to cover the employer financial

(ii) Cost due to damage of machinery, tools, materials and other property of the plant.

(iii) Cost of wages paid to the injured employee, while on sick leave.

(iv) Cost of time lost by foremen supervisors or other executives in:

- assisting an injured employee
- arranging the replacement the injured one
- training a newworker to replace the injured one.

(v) Cost of the time spent on the case by first aid attendants and hospital departmental staff.

(vi) Cost due to loss of profits on injured workers' productivity and on idle machines.

(vii) Overhead costs per injured worker for instance the expense of light rent etc. which continue while the injured employee is a producer.

In addition to this, the, injured suffers due to lack of income, and pain felt by the worker which cannot be compensated.

These losses are demonstrated by Foundry and Machine shop in India. During the year under review it had an establishment of 200. Cost time due to injuries were 12, days first aid cases 220. The accident occurance was typical, the most serious being the spillage of a laddle full of molten metal due to cable breakage. In

this accident 3 men were burnt.

The total costs paid were as follows:

(i)	Compensation payments	R. 300.00
(ii)	Medical expenses	R. 205.00
(iii)	Total insured costs	R. 400.00
(iv)	Cost time cases:	
	- by first aid cases	R. 200.00
	- by fellow workmen	R. 150.00
	- by supervisory staff	R. 120.00
(v)	Clean up laddle spill (overtime)	R. 60.00
(vi)	Production loss	
	- down time	R. 160.00
	- less production rate	
	- spoilage of material and equipment	R. 600.00
(vii)	Overhead expenses	R. 150.00
	GRAND TOTAL	R.2,445.00

Source: S. Kumar Personnel Management - Industrial Relations pg. 217.

However, these expenses do not include the repair of the damaged machine. Another example is given by Morogoro Canvas Mill in Tanzania (see the table below).

Table 2: Reported Fire Accidents 1987 - 1993

Location of accident	Cause	Areas affected	Years							No of fire extinguishers used	Cost of refilling fire extinguishers	Cost of repairing the machines
			1987	88	89	90	91	92	93			
Spinning	Electric fault	Looms	7	-	11	2	-	2	1	57	302100	5950000
Spinning	"	Draw frames	-	1	-	1	-	1	4	7	37100	57500
Spinning	"	Carding	-	4	21	9	-	6	7	54	286200	51230000
Spinning	"	Blow room	1	1	6	-	-	1	-	5	26500	513000
Spinning	"	Cone winding	-	1	2	3	-	-	-	7	32100	411000
Spinning	"	Speed frame	-	-	17	-	-	2	2	63	33390	1837689
Spinning	"	Ring frame	-	-	5	-	-	-	-	6	31800	513750
Spinning	"	Assembly winding	-	2	2	-	-	1	1	11	58300	597945
TOTAL			8	9	64	15	-	13	15	210	1108000	15003884

In Table 2, one can note that there were a total of 124 fire accidents during the period 1987-93. A total of 210 fire entinguishers were used during the period under review. It further shows that the company had to spend 1,108.000/= T.Shillings to refill fire extinguishers. In addition to that it spent TShs. 15,003,884/= for repairing the damaged machines due to fire accidents. The company would have saved this amazing amount for further investment, to increase it production capacity.

It should be noted that this amount does not cover compensation payments medical expenses lost time etc.

C. Kombane in her, MPA thesis (1994) points out that during the years 1987-93 total machine hours lost due to fire accidents were 149,157.01. This, she says is equivalent to 5,966,288.40 linear metres of cloth. Therefore, total metres lost due to manhours lost by injured persons and otal metres lost by machine damage due to fire accidents were 638,768.40 metres. The metres lost is equivalent to TShs.5,623,703,875/=. The table overlead clearly demonstrates the above statement.

Source: Morogoro Canvas Mill Ltd. Safety Office
NB: Money figures in the last two columns are in Tanzania Shillings.(TAS)

Table 3: Number of Fire Accidents, Machine Hours Utility and hours lost due to Fire Accidents

Location ofaccident	Cause	Areas affected	Total No. of accidents	Planned hours	Actual hours	Hours lost
Weaving	Electricity Fault	Looms	23	96552.0	75811.0	20740.9
Spinning	"	Drain frame	7	29855.0	63134.1	675352
Spinning	"	Carding	47	257447.2	253853.35	3618.65
Spinning	"	Blow room	9	193104.0	18350.48	11753.52
Spinning	"	Cone winding	6	949997.6	7663.50	11354.2
Spinning	"	Speed frame	21	160920.0	131560.72	29259.28
Spinning	"	Ring frame	5	562792.0	5381257.1	1284.97
Spinning	"	Assembly winding	6	370884.0	462116.04	53041.58
TOTAL			124	2621589.6	2472432.7	149157.01

Source: Morogoro Canvas Mill - Safety Office

Looking at the data provided by the two cases i.e. Morogoro Canvas Mill and the Foundry and Machine Shop in India one can conclude that:-

(a) Accidents to affect the performance of industries, and that it is very important to take control measures order to arrest the situation.

(b) There is a need for industries to practice safety methods. The principle of any industry, thus, should be safety first and profits second and not the reverse. The question is how? This is highlighted in the next section.

4.0 CONTROL MEASURES

As indicated earlier, large amounts of money and human resources are involved yearly in compensation payments etc.

Thus the purpose of taking control measures is to reduce the said costs.

The benefits of reducing the rates and the severity of occupational accidents and diseases include.

(i) More productivity due to fewer lost work days

(ii) more efficiency from workers,

(iii) reduced medical and insurance costs,

(iv) lower workers compensation rates and direct payments because of fewer costs.

(v) fewer deaths.

Due to the benefits indicated above it is not surprising that many organisations are trying to improve their occupational safety and health

However several control measures has been taken, by various government to arrest the situation.

These measures are as follows:

- Factory Act, Workmens Compensation Act, Insurance acts etc.

- Efforts made by the ILO (International Labour Oerganisation) for guarding of hazardous machinery and correction of other serious hazards and recompense for accident victims.

Other control measure which are recommended by safety professionals include the following:

(a) The Management to be positive and introduce an effective safety program. This positive attitude should be evident to surbodinates.

(b) Provision of a plan and design a safety operating process and procedure by the management

(c) Acceptance of the principles of safety program as part and parcel of the organisation

(d) A strict maintanance of machine and other quipments.

(e) Presence of proper facility to impart training in safety measures to all enployees

(f) A provision of safety equipments e.g. masks, safety boots, gloves, safety spectacles etc.

(g) A frequent thorough investigation of the cause of every accident. This will prevent the occurrence of the same accident.

(h) A need of having a frequent review of

accident prevention measures e.g. when introducing a new material or process, employees should be trained - oriented to the new material or process in order to prevent an unnecessary accident.

(i) When recruiting new employees they should undergo an examination both physically and mentally.

5.0 CONCLUSION

As indicated in section 3, the majority will agree with the author of this paper that accidents do affect negatively the performance of every industry i.e. instead of investing more, to increase its production capacity, the company had to spend a lot of money to pay compensations to injured employees, repairing damaged machines etc. This has been clearly demonstrated by thetwo cases, that is Morogoro Canvas Mill and Foundry and machine shop in India.

So, in order to further, its investments which will result to increased productivity, the industries should emphasize on safety methods and safety, programs. It is however the responsibility of both the employer and employees to prevent accidents. The employers, on their part, should try to apply control measures as highlighted in this paper, while the employees responsibility should be to stop unsafe behaviour.

FOOTNOTES

1. Schuller R. and Youngblood S. 1986, "Effective Personnel Management, Est Publishing Co. St. Paul, USA, pg. 484.

2. Kumar S. 1981, "Personnel Management, Industrial Relations, Smt, Sumitra Hand Publishers, New Delhi, pg. 214.

3. Kombane C., 1994 Industrial Accidents and their effect on work performance. The case of Morogoro Canvas Mill Ltd (an unpublished MPA. Thesis, IDM 1994) pg. 39

REFERENCES

1. Barret B. Rhodes E. and Beishon J. 1974, Industrial Relations and the Wider Society - Aspects of interaction, Northumberland Press, Ltd, Gateshead, Great Britain.

2. Ferreira, G. 1994, The importance of Health and Safety Representative Training - A future Perspective: A paper presented at safety and Health conference held in Johanesburg, from 24th May to 27th May. 1994.

4. Hansen L. 1992, "Safety Management - A call for (R) evolution", A paper submitted at Minerva Education Institute in New York, United States of America.

5. Grant V. and Smith G. 1973 "Personnel Administration and Industrial Relations, Lowe & Brydone Printers Ltd, Norfork, U.K

6. Graham H. and Bennet R. 1992, "Human Resources Management, Pitman Publishing House, London, U.K

7. Safety Management Journals February and April Issues, 1994, Johanesburg, S.Africa.

8. Nosa (National Occupational Safety Association) Journals on Safety and Health: Johanesburg, S. Africa April 1994.

9. Tim C 1994 - The Role of Health and Safety Representatives - a Paper presented at safety and Health conference, held in Johanesburg from 24th May to 27th May, 1994.

10. Vahapasi A. ILO - FINIDA, Safety Technical Advisor - Africa: A speech he gae at a safety and Healthy Workshop held in Gaborone, Botswana, in May 1994.