

EFFECTIVENESS OF HEALTH SAFETY MEASURES TOWARDS EMPLOYEES OF BHARAT HEAVY ELECTRICAL LIMITED

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ABSTRACT

The manufacturing sectors and the results indicated that empowered workers who played active health and safety role could result in health and safety performance improvements although the empowerment was limited. Although employee participation and involvement are crucial, the accountability and responsibility in the safety and health must come from senior management as required by the occupational health and safety legislation. The study is to understand the overall employee's welfare with special preference to Safety and Health programs for employees at BHEL-EDN. Surveys are conducted to know how the Safety, Health and Environmental Improvements measures are taken by the company. It is found that in BHEL EDN, certain measures have been taken to promote safety and health management- formulation of safety and health policy, formulation of separate safety cell, formulation of two-tier safety committee, safety instruction and training, safety audit, regular testing and certification by chemical and metallurgical testing centre, introduction of safety permit system in some areas specially in case of contractual labors. To conclude the company has given maximum effort and dedication to implement the labour laws and regulations and it has succeeded in implementing effective safety and health management considering the type of safety and health problems, accidents, employees and technology in its organizational settings and also good level of satisfaction among employees regarding healthy and safety has been achieved.

Keywords: Health, Safety, Labour legislation, Work Environment, HSE, Employees.

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INTRODUCTION

In the simple sense, human resource management means employing people, developing their resources, utilizing, maintaining and compensating their services in tune with the job and organization, individual and the society. Human resources management (HRM) can be defined as managing (planning, organizing, directing and controlling) the functions of employing, developing and compensating human resources resulting in the creation and development of human relations with a view to contribute proportionately (due to them) to the organizational individual and social goals. Psychologists are concerned with the theoretical considerations of accident causation and the research into the accident control, through proper selection, training and education of the employee, and the social and psychological factors that influence the individual's behavior in general. Engineers and safety officers usually render necessary practical advice on certain aspects in the industry. They look upon prevention of accidents basically as an engineering problem to be tackled through proper designing of mechanical safety devices. In fact, prevention and safety are interrelated and, therefore, require a multi-dimensional approach. Its importance has increased because of large-scale industrialization in which human beings are subject to mechanical, chemical, electrical and radiation hazards.

REVIEW LITERATURE

Previous studies such as by Mitchison and Papadakis (1999) have demonstrated that effective safety management improves level of safety in organization and thus can be seen to decrease damages and harm from incidents (cited from Bottani, Monica & Vignali, 2009). Safety management refers to the tangible practices, responsibility and performance related to safety (cited from Mearns, Whitaker & Flin, 2003). Mearns et al. noted some common themes of safety management practices: management commitment to safety, safety communication, health and safety objectives, training needs, rewarding performance, and worker involvement. They also maintained the associations between safety management, safety climate, and safety culture. Safety climate is considered to be the precise indicator of overall safety culture while safety management practices display the safety culture of top management and as a result, good safety management practices are reflected in enhanced safety climate of all employees. The terms "culture" and "climate" have been used interchangeably in the literature to reveal employees' attitudes towards safety (Glendon & Stanton, 2000; HSE, 2002). HSE (2002) defined safety climate as the attitudes in relation to safety within an organization. Hale (2000, p. 7) described safety culture as "the attitudes, beliefs, and perceptions shared by natural

groups as defining norms and values, which determine how they react in relation to risks and risk control systems”.

Abdullah, Spickett, Rumchev & Dhaliwal 56 Hsu, Lee, Wu, and Takano (2007) study on organizational factors on safety in Taiwan and Japan reported that the influence of organizational factors in both countries were different due to dissimilar culture. For example, they discovered that Taiwanese leadership style was “Top-Down Directive” where top management communicated safety policies and involved in safety activities while Japanese safety leadership was more focused on “Bottom-Up Participative” where top management promoted employees’ participation in any safety activities.

Besides leadership style, Marsh et al. (1995) noted that management commitment plays a vital role in all aspects of safety intervention. Management commitment to safety indicates the extent to which the organization’s top management demonstrates positive and supportive safety attitudes towards their employees’ safety (Hsu et al., 2007). From a prior study, Yule, Flin and Murdy (2007) noted that employees’ perception of dedicated management’s action to safety had resulted in accident reduction. The Occupational Safety and Health Council of Hong Kong conducted a study in the construction industry in 2001 and found out that senior management had a positive attitude towards safety culture; supervisors showed less positive responses than senior managers and front line workers demonstrated the lowest attitude towards safety culture. This study proposed cultivating a strong safety culture in the construction industry as this industry is one of the most hazardous industries in Hong Kong.

Supervisors also play an important role in ensuring safety in the workplace and employees conform to safety rules and procedures when they perceived that the action of their supervisor was fair (Yule, Flin & Murdy, 2007). On the contrary, they noted from previous surveys that supervisors who demanded more work from their workers demonstrated negative influence on safety climate and supervisors who delegated job task motivated employees to acknowledge their safety accountability. Cheyne, Oliver, Tomas and Cox (2002) conducted a study on employee attitudes towards safety in the manufacturing sector in UK. The study identified safety standards and goals, and safety management, which include personal involvement, communication, workplace hazards and physical work environment as factors that enhance safety activities in organization. The study found that a good physical working environment and employee involvement were key factors that contributed to safety activities in organizations. Safety training and safety policy are also essential determinants to enhance safety performance. Safety training is defined as knowledge of safety given to employees in

order for them to work safely and with no danger to their wellbeing (Law, Chan & Pun, 2006).

Lin and Mills (2001) found that clear policy statements and safety training played an important role in reducing accident rates. Earlier studies discovered the link between safety training and increased safety Abdullah, Spickett, Rumchev & Dhaliwal performance (Huang et al., 2006). Consequently, effective training assists workers to have a sense of belonging and thus, is more accountable for safety in their workplace. In addition, a company objective and communication of the objective to all workers is the crucial aspect of effective health and safety management as lack of communication may hinder employee involvement (Vassie & Lucas, 2001).

SCOPE OF THE STUDY

- It enables the researcher to understand the existing health and safety management policy at BHEL-EDN.
- It enables the researcher to understand the work practices and procedures at BHEL-EDN.
- It enables the researcher to understand health and safety training that is being conducted at BHEL-EDN.
- The study covered the major part of the organization.
- The findings of the research are derived from two hundred sample employees at BHEL-EDN.

STATEMENT OF THE PROBLEM

Even previous researches have shown that high rates of injury and accidents are due to unsatisfactory or non-existent of health and safety systems (Lin & Mills, 2001). Vassie and Lucas (2001) investigated health and safety management in the manufacturing sectors and the results indicated that empowered workers who played active health and safety role could result in health and safety performance improvements although the empowerment was limited. Although employee participation and involvement are crucial, the accountability and responsibility in the safety and health must come from senior management as required by the occupational health and safety legislation (Vassie & Lucas, 2001). The study is to understand the overall employee's welfare with special preference to Safety and Health programs for employees at BHEL-EDN. Surveys are conducted to know how the Safety, Health and Environmental Improvements measures are taken by the company.

NEED FOR THE STUDY

Health and safety is very important in BHEL EDN, because it is manufacturing unit for the electrical products for power industry, there is a chance for having lot of accidents, so it is the duty of safety department to provide proper HSE measures. The need for the study is to know whether the company is providing necessary measures for the employees health and safety & Environment

OBJECTIVES OF THE STUDY

The main objective is to understand how well organized and systematic is the Health, Safety and Environment Management System at BHEL-EDN and how it affects the welfare of the employees.

1. To study the effectiveness of safety measures in reducing the accident rate and losses.
2. To assess the effectiveness of medical facilities provided by the organization and level of satisfaction of employees.
3. To identify and suggest measures to improve health, safety and working conditions.
4. To know the employees perception regarding the safety program and practices.
5. To identify and suggest measures to improve the environmental factors which affects the performance of the employees.

LIMITATION OF THE STUDY

- More numbers of samples could not be included owing to time and cost constraints
- The study was confined to only ELECTRONIC DIVISION of BHEL.
- The findings of the study therefore may not hold good to other divisions of BHEL, other than BHEL-EDN and Confidential facts were not revealed.
- Time is a major constraint as it was restricted only to a period of 4 weeks.
- Another important constraint is the hesitation from the side of employees and workers as they are unwilling to answer questions in the questionnaire.
- Only a limited number of respondents are considered for the study as the sample size is only 200 and so it restricts the total representation of all workmen and employees regarding safety and health measures.

METHODOLOGY

Type of Research: The type of research is selected on the basis of problem identified. Here the research type used is **descriptive research** which includes surveys and fact finding enquire of different kinds. An attempt has been made to discover various aspects of the problem and to give suggestion.

Source of Data: The source are used to collect the data in this research are; Primary data and Secondary data.

Collection of Data: For the study regarding Health and safety measures in BHEL-EDN, both primary and secondary sources of data are used.

Primary data: Primary data has been collected from the respondents selected for the study. Interviews have been conducted with the help of a structured questionnaire, which consists of different questions relating to the safety and health measures provided in the BHEL-EDN.

Secondary data: Secondary data is collected mainly from the records, reports, notes, and accounts etc. which are retained by the company for further requirements. In addition various books, journals have also been referred.

Sampling Techniques: Population: The population for this research is 2000 ie, All the employees and workmen of BHEL-EDN, Bangalore constitutes the sampling unit.

Sampling Elements: Sampling Elements are the employees of the BHEL EDN

Sample size: The sampling size for the study in BHEL-EDN is 200

Sampling method: The method adopted here is the simple Random Method. A random sample is that where each item in the universe has equal chance of being selected.

Statistical Tools used in data analysis: The collected samples are interpreted with the help of statistical tools like tabulation and percentages and t-test.

ANALYSIS AND INTERPRETATION

Table 1.1: Opinion of the Employees for Safety Measures

Sl.No	Opinion	Attribute	No. of respondents	Percentage of respondent	T-test	P-Value
1	Health and Safety Policy	Very good	68	34%	2.305	0.001
		Good	120	60%		
		Satisfactory	12	6%		
		Poor	0	--		
2	Company Posses safety manual	Yes	188	94%	3.756	0.003
		No	12	6%		
3	Managements respond towards accident	Very Quick	180	90%	4.26	0.123
		Slow	20	10%		
4	Main factor in case of Accident	Lack of technical skills	60	30%	12.568	0.336
		In experience	76	38%		
		Socio-psychological factors	36	18%		

		Stress/Boredom	28	14%		
5	Met any accident till date (on the job)	Yes	48	24%	3.004	0.0001
		No	152	76%		
6	Accidents mostly occurring	Production area	144	72%	2.789	0.0001
		In the premises of the	56	28%		
7	Accidents/incidence are reported or recorded	Yes	148	74%	0.0125	0.451
		No	52	26%		

Source: Primary Data

Table 1.1 reveals that Out of 200, 120 employees opinion about Health and Safety Policy is good, 68 employees are opinioned. 94% of the respondents agree that the company posses a safety manual, 6 % of the respondents disagree that the company posses a safety manual. 90% of the respondents say that the management's response towards accident is very quick and 10% of the respondents say that it's slow. The accidents in the company have occurred due to the inexperience (38%) of the employees. However some of the employees (30%) attribute the occurrence of accidents to lack of technical skills. Some of the employees (18%) attribute the occurrence of accidents due to socio and psychological factors and balanced respondents commended those (14%) accidents due to stress and boredom. 76% of the respondents have not met with an accident and 24% of the respondents have met with an accident. Of that 72% of the accidents occur in the production area and 28% occur in the premises of the company, other than production finally, 74% of the accidents/ incidents are reported and recorded, but 26% of the respondents say that they are not reported or recorded. The p values also reflect that proves the significance of the respective attributes.

Table 1.2: Opinion of the Employees for Health and Work Environment Measures

Sl.No	Opinion	Attribute	No. of respondents	Percentage of respondent	T-Test	P- Value
1	Remedial action in case of complaint regarding health, safety and environment	OHS working group	52	26%	7.659	0.003
		Manager of the department	28	14%		
		Safety officer	112	56%		
		Any other officer	8	4%		

2	Satisfied with working environment light, sound, pollution and ventilation	Satisfied	156	78%	0.1235	0.1256
		Dissatisfied	44	22%		
3	Participated in any (HSE) training programs	Yes	140	70%	6.25	0.453
		No	60	30%		
4	visual signals like safety signs & boards	Clear	172	86%	2.365	0.075
		Not clear	28	14%		
5	Mandatory safety personal protective equipment in place	Yes	168	84%	1.1298	0.002
		No	32	16%		
6	First aid measures available in the organization	Excellent	24	12%	0.265	0.001
		Good	120	60%		
		Satisfactory	52	26%		
		Not up to the mark	4	2%		
7	suffering from occupational diseases	Yes	0	0%	0.022	0.158
		No	100	100%		
8	medical facilities by the organization	Yes	196	98%	1.856	0.987
		No	4	2%		
9	authorities towards safety & Health complaints	Quick	164	82%	4.563	0.004
		Slow	32	16%		
		No response	4	2%		
10	with overall efforts taken by company to promote safety & health	Yes	184	92%	1.956	0.789
		No	16	8%		

Source: Primary Data

Table 1.2, opinion of the respondents about health and work environment measures 26% of the respondents agree that the remedial action is taken by OHS working group, 14% of the respondents agree that the manager of the department takes the remedial action, 56% of the respondents agree that safety officer will take the remedial action and 4% of the respondents agree that any other officer takes the remedial action. 78% of the respondents are satisfied with the working environment and 22 % of the respondents are dissatisfied with the working environment. From the above table it can be inferred that most of the respondents are satisfied with the working environment with respect to light, sound, pollution and ventilation. 70% of the respondents have participated in the HSE training programs and 30% of the respondents have not participated in the HSE training programs.

Of that 86% of the respondents the visual displays are clear and 14% of the respondents say that the displays are unclear. 84% of the respondents agree that there are PPE in hazardous areas and 16% of the respondents do not agree that there is safety PPE in hazardous areas. 12% of the respondents say that first aid measures are excellent, 60% of the respondents say that they are good, 26% of the respondents that first aid measures are satisfactory and only 2% of the respondents say that the first aid is not up to the mark. 100% of the respondents are not suffering from any occupational diseases. Of that, 98% of the respondents are satisfied with the medical facilities and 2% of the respondents are not satisfied with the medical facilities by the organization. 82% of the respondents are comment as Quick responds from the authorities towards safety & health complaints, 16% of the respondents are comment that slow response and 4% respondents comment as no response. 92% of the respondents are satisfied with overall efforts taken by the company to promote safety and health and 8% of the respondents are not satisfied with the efforts taken by company to promote safety & health.

FINDINGS

1. Majority of the employees are aware of health and safety policy at BHEL-EDN.
2. Safety manual is known and followed by all the employees.
3. Majority of the respondents agree that the management's response towards accident is very quick.
4. Majority of the respondents agree that the occurrences of accidents due to inexperience
5. Majority of the respondents agree that the occurrences of accidents are low.
6. Majority of the respondents agree that if at all accidents happen then that would mostly occur at production area.
7. Majority of the respondents agree that most of the accidents or incidents are reported or recorded.
8. Majority of the respondents agree that the safety officer will take remedial action in case of complaint regarding safety, health & environment.
9. Majority of the respondents are satisfied with the working environment with respect to light, sound, pollution, ventilation etc.
10. Majority of the respondents have participated in the Health, Safety and Environmental training programs.
11. Majority of the respondents agree that the visual displays are clear at the workplaces.

12. Majority of the respondents agree that there exists safety Personal Protective Equipment (PPE) in place for all to be used while entering hazardous areas.
13. Majority of the respondents agree that the first aid measures are reasonably good.
14. According to the survey none of the employees are suffering from any occupational diseases.
15. Majority of the respondents are satisfied with the medical facilities at BHEL-EDN.
16. Majority of the respondents are satisfied with the quick response of concerned authorities towards the safety & Health complaints
17. Majority of the respondents are satisfied with the overall efforts taken by company to promote safety & health.

SUGGESTIONS

1. Well organized and educative training programs have to be provided in frequently to the employees so that they can upgrade themselves towards the latest facilities, the safety training should need once in 6 month
2. Electrical hazardous areas have to display a bold sign board.
3. Family health contact program for the awareness in alcoholism
4. Rather than the general safety awareness programs ,try to involve production basis or department basis safety training programs
5. The BHEL EDN having 2000 employees. As per the Indian Factory act ,one ambulance should be needed for more than 500 employees, so in this organization needed four Ambulance facilities
6. The apprentices working in the organization have not getting proper personnel protection equipments , so the company should ensure the safety of them
7. The visitors are not allow to cross the yellow line in production area
8. Try to include chemical test together the pre medical check up of new entered employees, it will helps to know about occupational hazards .
9. Avoid the privet vehicles moving in side the factory. It will increase the chances of accident
10. Premises of the BHEL have to be kept free from dust and other waste materials with the frequent use of mobile vacuum vehicles.
11. Spittoons have to be kept clean through out the office hours.
12. Too many materials are dumped on either sides of the employee's walking area, which has to be cleared for a better environment at BHEL.

13. Few of the respondents have requested the management for displaying latest photographs, posters and videos regarding safety.

CONCLUSION AND RECOMMENDATION

After the whole study of the Effectiveness of Health, Safety towards the employees in BHEL-EDN at Bangalore, the conclusion arrived at is that the avoidance of accidents together with ensuring the Health and Safety of the employees is one of the integral and important element that ensures development in the competence of the workforce, growth in the production and increase in Industrial production. The benefits of prioritizing the Health and Safety measures in the company are immense and can be used to reinforce the fundamental Industry values. The research conducted at BHEL EDN on “Role of industrial health and safety and promoting employees welfare” gives a conclusion that BHEL EDN has given its maximum effort and dedication to implement the labour laws and regulations regarding occupational health and safety in work place to promote the employees welfare within the company and have successfully achieved, improved satisfaction level of the employees regarding occupational health and safety on job and an improved overall job satisfaction. It is found that in BHEL EDN, certain measures have been taken to promote safety and health management- formulation of safety and health policy, formulation of separate safety cell, formulation of two-tier safety committee, safety instruction and training, safety audit, regular testing and certification by chemical and metallurgical testing centre, introduction of safety permit system in some areas specially in case of contractual labors. To conclude the company has given maximum effort and dedication to implement the labour laws and regulations and it has succeeded in implementing effective safety and health management considering the type of safety and health problems, accidents, employees and technology in its organizational settings and also good level of satisfaction among employees regarding healthy and safety has been achieved.

REFERENCES

1. Alli, B. O. 2001. “Fundamental principles of occupational health and safety”, Retrieved: 20 January 2008, from <http://www.ilo.org>.
2. Bottani, E., Monica, L. & Vignali, G. 2009. “Safety management systems: performance differences between adopters and non-adopters”, *Safety Science*, vol. 47, pp. 155 – 162.
3. Carder, B. & Ragan, P.W. 2003. “A survey-based system for safety measurement and improvement”, *Journal of Safety Research*, vol. 34, no. 2, pp. 157 – 165.

4. Cheyne, A., Oliver, A., Tomas, J.M., & Cox, S. 2002. "The architecture of employee attitudes to safety in the manufacturing sector", *Personnel Review*, vol. 31, pp. 649 – 670.
5. Erickson, J. A. 2000. "Corporate culture: the key to safety performance", *Occupational Hazards*, vol. 62, no. 4, pp. 45-50.
6. Fleming, M. & Lardner, R. 1999. "Safety culture – the way forward", *The Chemical Engineer*, 16 – 18. Retrieved: 15 January 2007, from <http://www.keilcentre.co.uk/downloads/Culture.pdf>.
7. G. Salvendy (Ed.), *Handbook of Human Factors and Ergonomics*. New Workplace health, safety and welfare. Workplace (Health, Safety and Welfare) Regulations 1992. Management of health and safety at work. Management of Health and Safety at Work Regulations 1999. Approved Code of Practice and guidance L21 (Second edition) HSE Books 2000.
8. Hsu, S.H., Lee, C.C., Wu, M.C., & Takano, K. 2007. "Exploring cross-cultural differences in safety climate of oil refinery plants in Japan and Taiwan", in *Proceedings of the International Conference on Business and Information*.
9. Kongtip, P., Yoosook, W. & Chantanakul, S. 2008. "Occupational health and safety management in small and medium-sized enterprises: an overview of the situation in Thailand", *Safety Science*, vol. 46, pp. 1356 – 1368.
10. Murphy, D. L. 2003. "Safety in public emergency services: lessons learned from the private sector", *Fire Engineering*, 69 – 72.
11. Oyan, T. 2000. "Putting optimism into your safety program", *Occupational Hazards*, vol. 62, no. 1, pp. 66-69.
12. Tokyo, Japan, 11-13 July 2007. Retrieved: 20 March 2008, from <http://ibacnet.org/bai2007/proceedings/Papers/2007bai7280.doc>.
13. Vassie, L.H. & Lucas, W.R. 2001. "An assessment of health and safety management within working groups in the UK manufacturing sector", *Journal of Safety Research*, vol. 32, no. 4, pp. 479 – 490.
14. Yule, S., Flin, R. & Murdy, A. 2007. "The role of management and safety climate in preventing risk-taking at work", *International Journal of Risk Assessment and Management*, vol. 7, no. 2, pp. 137 – 151.