Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 6, Issue, 09, pp.8542-8547, September, 2014

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

ISSN: 0975-833X

RESEARCH ARTICLE

EVALUATION OF MANAGEMENT OF OCCUPATIONAL HAZARDS IN GHANAIAN COMPANIES: THE CASE OF GHANA GRID COMPANY LIMITED (GRIDCo)

***[1]Sulemana Alhassan and [2]Malik Ali Abu Daabu**

[1]Department of Secretary Ship and Management Studies, Master of Business Administration (MBA), Tamale Polytechnic, Tamale
[2]Commonwealth Executive Master of Business Administration (CEMBA), Ghana Grid Company Limited (GRIDCo), Tamale

ARTICLE INFO

Article History:
Received 14th June, 2014
Received in revised form
06th July, 2014
Accepted 10th August, 2014
Published online 18th September, 2014

Key words:

Workplace, Hazards,
Causes, Effects and Mitigation.

ABSTRACT

The purpose of the study was to evaluate the practices of occupational hazards management in Ghana Grid Company Limited. This was conducted against the backdrop of growing workplace accidents in Ghana. Data was collected using a five point Likert-type scale questionnaire. Respondents were selected based on stratified purposive sampling techniques. Management showed appreciable level of commitment to hazards management. Respondents exhibited an appreciable level of consciousness. Potential causes of hazards were generally human related but preventive methods lack some modern approaches. Generally, management of workplace hazards in Ghana Grid Company Limited is fairly good.

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INTRODUCTION

The 1992 Republican Constitution accords Ghanaians the fundamental human rights which include decent work (Article13-33). Also Ghana's concerns to occupational hazards are enshrined in Article 118-126 (xv) of the 2003 Labour Act, (Act 651). Employers are enjoined among others to maintain their plant, ensure absence of risk, provide necessary information for workers, and to prevent contamination. Others are, supply of safety appliances to minimize potential hazards at the workplace. Also, The Factories, Offices and Shop Act of 1970 stipulated for cleanliness, adequate space, proper ventilation, sanitary accommodation, provision of protective cloths, appliance, reduced noise etc. at the work place. Despite all these provision, there have been incidents of workplace accidents especially fire and electricity related cases. It is against this backdrop the researchers conducted this study to evaluate the hazards management of GRIDCo in the mists of seemingly growing workplace hazards in Ghana. Pertinent questions to which the research sought answers were (i) what were the predominant causes of work hazards in GRIDCo? (ii) To what extent were GRIDCo workers aware of the nature of workplace hazards? (iii) To what extent was management of GRIDCo committed to preventing/mitigating workplace hazards.

Corresponding author: Sulemana Alhassan,
Department of Secretary Ship and Management Studies, Master of Business Administration (MBA), Tamale Polytechnic, Tamale.

(iv) What were the effects of occupational hazards on GRIDCo? This study would step up safety awareness in the organization and make the workplace more humane by injecting more managerial responsibilities and also to meet the requirement of our democratic dispensation. Again, findings would stimulate the need for training program by safety officials to minimize workplace hazards. The study would help the average worker to act responsibly to minimize pains and suffering which money cannot compensate. The report should avail healthy and safety practices for organizational collaborations to promote occupational safety. It would arouse management to stand up to the task of safety, health and welfare matters and practices which hitherto did not attract their attention.

Occupational Hazards

Huges and Ferret (2003) classified occupational hazards under thirteen (13) distinct headings which are; equipment/ mechanical hazards such as friction; transport hazards such as works vehicles; access related hazards such as slips/trips and falls; handling such lifting or manual handing; electricity hazards such as fixed installation, portable tools and equipment; chemical hazards such; dust, fume or gas; fire and explosion hazards such as flammable materials/gases; particles and dust such as inhalation or ingestion; radiation; biological hazard such as bacterial, viral and fungal; environmental hazards such as noise vibration, light, humidity ventilation,

temperature, overcrowding; The individual related hazards such as individuals not suited to work, long hours, or high work rate violence; and other factors such as poor maintenance, lack of supervision, lack of training, lack of information, inadequate instruction and unsafe system. Bernardi (2003) reported hazards to include eye fatigue, irritation, blurred vision, headache, dizziness, muscular pain, wrist problem, failed pregnancy arising from the use of visual display terminals (VDTs)

Causes of Workplace Hazards

According to Ghana's Factories, Offices and Shops Act (1970), hazards are caused by dirt, over-crowding, inadequate ventilation, poor lightening system, wet floors, and use of poisonous substances in the course of productive activities. Others are, type of protective cloth, noise, vibration, lifting of excessive weights, inexperience workers, non-fencing of workplace, insufficient and obstructed space for motion machines, unfenced transmission and other machinery and all part of electric power generation. Again, human error, poorly maintained equipment, bad indoor air quality are causes of hazard.

Bernardi (2003) in discussing causes of accidents alluded to poor equipment design. Schuber and Huber (1990) classified the causes of hazards into two main groups i.e. socio-psychological and physio-psychological. The former is associated to low quality of work life, stress, dissatisfaction, apathy, withdrawal, projection 'tunnel vision. Others are forgetfulness, inner confusion about roles and duties, mistrust of others, inattentiveness, irritability, procrastination, and disgruntled over trifles whereas, hazards emanating from physio - psychological conditions, are loss of life, cardiovascular disease, leukaemia etc. Eva and Oswald (1981) as cited by Torrington and Hall (1998) identified a number of health and safety concerns of union in the 70's which included accidents arising due to new technology.

Effects of Hazards

The effects of hazards are wide and have excruciating effects on organizations. As noted by Torrington *et al.* (2008), each year in the United States of America, on average, as many as 6,000,000 lesser injuries in occupational accidents, 400,000 occupational disease and 100,000 deaths from disease are recorded. Bernardi (2003) reported that there had been increased in total injuries and illnesses since 1984 mainly due to reports of repetitive strain injury (RSI) which constituted nearly two thirds of all workplace injuries. RSI is an umbrella term for a number of overuse injuries affecting the soft tissues (muscles, tendons and nerves of the neck, upper and lower back, chest, shoulder arms and hands. RSI is an occupational injury that occurs from continuous and repetitive physical movement such as assembly line work or data entry typically arising as aches and pains.

Hughes and Ferret (2003) noted that a 10MA current will cause muscle contraction which can lead to a temporal seizure of the heart. Cardiac arrest is a case normally associated with electrical shocks. According to Bernardi (2003), older Americans suffer because of the conditions of which they were exposed at work decades ago. Obviously, regardless of the type of hazard, all events of accidents and incidents are tragic for employees and their families, co-workers and employers. There is pain at the time of accident and there can be psychological problems later for the families of both surviving victims. In addition to pain, suffering and death there are also directly measurable cost to both employee and employer. The numbers of work days, lost due to death and injuries among workers. Bernardi (2003) reported that, stress is making workers sick, increasing their potential for violence at work and affecting productivity and accident rates. This situation as he estimated caused Corporate America an amount of $200 billion annually in absenteeism, loss of productivity and medical insurance.

Creating awareness of Job Hazards

Noe, Hollenbeck, Gerhardt, and Wright (2004) identified five distinct ways of communicating hazards which are; direct talking by managers to employees about job hazards, use of memos, training and retraining. These researchers explained that retraining curbs complacency about real dangers and the use of memos and posters constantly remind or reinforce messages and helps to establish paper trail that can later document history of workers concern about job hazards. Other ways of communicating hazards include conferencing before executing a piece of work, issuing station guarantee and in wellness program. Many organisation keep safety hand books that prescribe reporting system of injuries (see GRIDCo safety handbook, 2009). Huge and Ferret (2003) reiterated the need for employees to use and maintain safety signs especially wherein such places are prune to high risk in the workplace.

Managerial Commitment to Safety and Health in the organization

One crucial or most important key player in the management of safety and health in the organization is the employer. Admittedly his position is highly conflicting and contradicting hence, Torrington and Hall (1998 P.522) pointed out that, "There is always a conflict between the needs of the employer to push for increased output and efficiency and the need of employee to be protected from hazards of workplace". Torrington (1998) referred to criticism that out of 121 policy documents investigated, most expressed clear commitment to health and safety but, few contained appropriate details of the necessary arrangement for implementing policies. This implies that there is a gap between words and actions on the part of management. Another fall out in managerial commitment to safety and health is the enactment of uncountable statutory acts and regulation and their accompanying criminalization to compel management to behave responsibly.

Torrington *et al.* (2008) summarised the responsibilities of management at workplace to include; provision of rest and no smoking areas, ensuring safe use of machines, provision of appropriate protective equipment for workers, provision of lifting and training, free eye test, glasses, provision of risk assessment every five years, safeguarding workplace from biological agents. Others are incorporation of health consideration, harmonizing both visual and acoustic signs and

protecting pregnant women. Occupational safety laws and regulations require absolute commitment on the part of the employer. However, with the unsatisfactory behaviours of employers, Bernardi (2003) said there is an increasing awareness of managerial failure to pay greater attention to the health and safety of employees. This awareness has been translated into criminal charges and financial devastation for some companies.

Positive commitment by management occurs, when they make resource available on health and safety issues and also empower employee on matters of safety. Huges and Ferret (2003) reiterated exemplary leadership, commitment to safety and health matters when they said management (in particular, senior managers) can give powerful message to the workforce by what it does for health and safety and when management demonstrates what it wants to achieve.

Prevention of Hazards

Torrington *et al.* (2008) pointed out prevention schemes at workplaces to include, health surveillance (where known adverse effects of a particular substance exist).Training regarding risk, reorganization of work (this may include changes that could be grouped as organizational development i.e. job rotation), and positive health programmes (in terms of healthy eating or no smoking campaigns). Bernardi (2003) also pointed out personnel selection (to employ people who are less prone to accident) employee training and incentives programmes (to change behaviour) and the publication of safety rules and regulations. Others he said, are creating a security conscious organization culture, screening employees, building threat management teams and employer assistance programs (to help employee with personal problems).

Noe *et al.* (2004) also asserted the reinforcement of desirable behaviours through safety incentive programmes and not mere defining how to work safely. Noe *et al*. (2004) also implied preventive method when they identified job analysis technique and the technique operation review. By description the former has to do with breaking down a piece of job into basic elements and each rated for potential to harm or causing injury. Job elements with possible hazard are isolated technologically or behaviour put in place to reduce the said hazard.

MATERIALS AND METHODS

In the light of recent global changes and sub-regional economics and competition, energy experts have strategized to maximize the use of Ghana's electrical resource by stratifying the consumer population in terms of consumption levels, and increased the chain of transmitters in the supply chain. This led to the creation of Ghana Grid Company (GRIDCo) in 2006 and its operationalization in 2008 as an independent utility body in accordance with Ghana's Energy Commission Act of 1997 (Act 541) and Volta River Development Amendment Act of 2005 (Act 692). This novel organization has the sole objective of dispatching and transmitting electricity from wholesale suppliers to bulk consumers. It operates over 4000km high Voltage transmission lines across 43 Substation in Ghana and the West Africa sub Region with a load capacity of 330kv to 11kv to its large scale consumers. GRIDCo is the area of the study and the target population is the entire personnel in various operational location of the company throughout Ghana. GRIDCo has seven areas of operation across the country namely: Volta, Takoradi, Akosombo, Kumasi, Tamale, Prestea, Techiman and each of the operational areas are made up of seven sections namely, Line Maintenance, Electrical Maintenance, Corporate Communication, Protection and Control, Finance, Administration and the Administrative Head Office. The size of workers vary from a minimum of five (5) to maximum of ten (10) for each section.

For the purpose of complementary a mixed qualitative and quantitative survey research design was used for the study in order to measure overlapping but different phenomena (Crump and Logan, 2008). The sample size was ninety-eight (98) personnel purposely selected from the target population based on stratified purposive sampling technique in equal proportions of two personnel from each section of the seven operational areas of GRIDCo. Each respondent had at least two years working experience in the organisation. The composition was as presented in Table 1 below. Five point Likert-type survey questionnaires were delivered to 98 workers of GRIDCo across all the operational areas through mail or hand delivery. There was 100% response rate. Tables were generated and analysis was done in percentages, means and standard deviation using Statistical Package for Social Scientists (SPSS) version 16. By proximity to the researchers, GRIDCo employees at the Tamale location were selected for pilot testing. The pilot test revealed that respondents were reluctant to complete open ended questions. Hence, most open-ended questions were modified into closed ended questions to curtail this unexplained reluctance.

RESULTS

Rank of Respondents

This section highlights ranks of workers at GRIDCo by indicating the calibre of respondents. Frequencies and percentages are used for this purpose as in Table 2

Table 1. Sample Composition according to Sections and Operational Areas

Sections in Each Area	Operational Areas Nationwide							
	Volta	Takoradi	Prestia	Kumasi	Techiman	Tamale	Akosombo	
Protection & Control.	2	2	2	2	2	2	2	4
Line Maintenance	2	2	2	2	2	2	2	14
Electrical Maintenance	2	2	2	2	2	2	2	14
Finance	2	2	2	2	2	2	2	14
Communication	2	2	2	2	2	2	2	14
Administration	2	2	2	2	2	2	2	14
Head Office	2	2	2	2	2	2	2	14
Total	14	14	14	14	14	14	14	98

Source: Researchers Construct, 2013

Table 2. Distribution of Respondents by Rank

Rank.		Freq.	%
1.	Principal Engineer	4.00	4.08
2.	Senior Engineer	8.00	8.16
3.	Engineer	12.00	12.24
4.	Assistant Engineer	4.00	4.08
5.	Assistant Chief Technical Engineer	4.00	4.84
6.	Principal Technician Engineer	15.00	15.30
7.	Senior Technician Engineer	16.00	16.32
8.	Technician Engineer	14.00	14.28
9.	Maintenance Mechanic	5.00	5.10
10.	Plant Attendants	5.00	5.10
11.	General Labourers	3.00	3.06
12.	Administrative Officers	2.00	2.04
13.	Administrative Assistants	2.00	2.04
14.	Finance officer	2.00	2.04
15.	Accounting Assistants	2.00	2.04
Total		**98**	**100**

Source: field survey, 2013

Table 2 revealed that 47(48%) of the respondents were senior officers in the organization, implying that the respondents were experienced persons and provided answers based on their experiences in the organization. This therefore validated the results from the study or added credibility to it.

as well as the doses of education through training to manifest the right response to workplace hazards.

91% of the respondents were aware that the predominant causes of hazards were socio-psychological factors (see Table 3). 49% of the respondents (Table 6) perceived prevalence of RSI. 91.4% of respondent were highly conscious that GRIDCo's recorded deaths, absenteeism (97.9% respondents), and electrical shocks (96.9 % of respondents) are not attributable to work hazards. However, as shown in Table 4, 76% of the respondents scored below the mean mark of 1.26 out of five questions asked to determine types of liquid to use in extinguishing various types of fire.

Management Commitment to Mitigation of workplace hazards at GRIDCo

The third objective of the study was to explore the extent to which management of GRIDCo was committed to hazards management. On a five point Likert scale, respondents revealed some average level of commitment of management with regards to workplace hazards. Management was reported to be actively participating in OHS, 92.7% respondent agreed to this.

Table 3. Distribution of respondents by perceptions of causes of workplace hazards

	Causes of hazards	Strongly disagree (1)		Disagree (2)		Neutral (3)		Agree (4)		Stronglyagree (5)		Total score	Std	Mean score
		f	%	f	%	F	%	f	%	f	%			
1	Poor nature of protective cloths used	60	61.2	21	21.4	10	10.2	2	2.0	5	5.1	165	1.00	1.68
2	Insufficient workspace	45	45.9	20	20.4	25	25.5	5	5.1	3	3.1	195	1.00	1.99
3	Unfenced transformer stations	50	51.0	40	40.8	8	8.2	0	0.0	0	0.0	154	0.64	1.57
4	Poor equipment design.	35	35.7	50	51.0	10	10.2	2	2.0	1	1.0	178	0.78	1.82
5	Socio-psychological factors	0	0.0	8	8.2	10	10.2	49	50.0	31	31.6	397	0.89	4.05
6	Inexperienced workers	5	5.1	8	8.2	40	40.8	35	35.7	10	10.2	331	0.96	3.38
7	The use of sub-standard materials	60	61.2	35	35.7	3	3.1	0	0.0	0	0.0	139	0.55	1.42
8	Fire explosion accidents	80	81.6	10	10.2	8	8.2	0	0.0	0	0.0	124	0.60	1.27
9	Unkempt radiation materials.	51	52.0	40	40.8	5	5.1	2	2.0	0	0.0	154	0.69	1.57
10	Use of out-dated machines causes	8	8.2	40	40.8	49	50.0	1	1.0	0	0.0	268	3.1	2.44
11	Vehicular accidents in GRIDCo	0	0.0	40	40.8	50	51.0	8	8.2	0	0.0	262	0.62	2.67
12	Newly introduced technology.	12	12.2	58	59.2	11	11.2	9	9.2	8	8.2	237	1.01	2.42
13	Lifting excessive weights.	50	51.0	30	30.6	18	18.4	0	0.0	0	0.0	164	0.77	1.67
14	Stress is accountable for accident	4	4.1	4	4.1	50	51.0	40	40.8	0	0.0	322	0.73	3.29

Predominant Causes of Workplace Hazards in GRIDCo

Out of the fourteen items in the scale of causes of workplace hazards as shown with Table 3, five items namely; (i) Psychological factors, (ii) inexperienced workers, (iii) the use of out dated machines, (iv) accidents, and (v) stress were main indicators of causes of workplace hazards in GRIDCo. These items registered standard deviation of less than one (1) and total scores above group mean of 220.57 in the scale. Other causes such as (vi) poor nature of protective cloths, (vii) insufficient space, (viii) unfenced transformer, (ix) poor equipment design and (x) the use of substandard materials were indicated as minimal causes of hazards.

The Extent of Workers Awareness of the Nature of Workplace Hazards at GRIDCo

Research question two (2) inquired to know the extent to which workers were conscious of the nature of hazards in their workplace, the behaviour they put under emergency situations

Table 4. Distribution of Respondents by Test Scores

Test score (marks x)	Freq.	(f)fx	x^2	$f(x^2)$	%
0.00	15.00	0.00	0.00	0.0	15.30
1.00	60.00	60.00	1.00	60.00	61.22
2.00	10.00	20.00	4.00	40.00	10.20
3.00	10.00	30.00	9.00	90.00	10.20
4.00	1.00	4.00	16.00	16.00	1.02
5.00	2.00	10.00	25.00	50.00	2.04
Total	98	124	55	256	100

Group Mean 1.26, Standard deviation 1.01
Source: field survey, 2013

Also 96.9% of the respondents attested to management concern for health programs and 91.8% agreed that management is committed to the supply of protective wears and equipments (see Table 5 below).

Effects of occupational hazards in GRIDCo

Out of seven items in the construct on Table 6, one item; RSI prevalence recorded mean 3.62 and a standard deviation of

Table 5. Distribution of Respondents' Perception by Managerial Commitment to workplace hazards in GRIDCo

	Areas of managerial Commitment	Strongly disagree (1)		Disagree (2)		Neutral (3)		Agree (4)		Strongly agree (5)		Total score	Mean score	Std
		f	%	f	%	f	%	f	%	f	%			
1	Top management participates actively in OHS in GRIDCo.	0	0.0	3	3.1	4	4.1	50	51.5	40	41.2	418	4.27	0.70
2	Management is committed to health programmes	0	0.0	1	1.0	2	2.0	45	45.9	50	51.0	438	4.47	0.60
3	Commitment by management to workers development	0	0.0	0	0.0	60	61.2	38	38.8	0	0.0	332	3.39	.049
4	Committed of Management to supply of protective wears and equipment	0	0.0	0	0.0	8	8.2	40	40.8	50	51.0	434	4.43	0.64
5	Management relies also on foreign consultants/experts to deal with hazards	5	5.1	10	10.2	50	51.0	30	30.6	3	3.1	310	3.16	0.85
6	Management commitment to provision of recreational facilities	20	20.4	45	45.9	30	30.6	2	2.0	1	1.0	213	2.17	0.81
7	Management uses incentives to promote behaviours towards safety	36	36.7	60	61.2	1	1.0	1	1.0	1	1.0	163	1.71	0.56

Group mean 375.0 Source: Field Survey, 201

Table 6. Distribution of Respondents by Effects of Workplace Hazards on GRIDCo

	Effects of hazards	Strongly disagree (1)		Disagree (2)		Neutral (3)		Agree (4)		Strongly agree (5)		Total score	Mean score	Std
		F	%	F	%	f	%	f	%	F	%			
1	Frequent death are recorded Due to occupational hazards	70	71.0	20	20.4	5	5.1	1	1.0	2	2.0	139	1.42	0.81
2	Occurrence of fatal disease after pension	65	66.3	15	15.3	8	8.2	8	8.2	2	2.0	161	1.64	1.1
3	Absenteeism arising from occupational hazards	67	68.4	23	23.5	5	5.1	3	3.1	0	0.0	140	1.43	0.73
4	There is a rise in fears of hazards among employees	50	51.0	43	43.9	4	4.1	1	1.0	0	0.0	152	1.55	0.62
5	Huge price of compensation Payments	2	1.96	60	61.2	30	30.6	5	5.1	1	1.0	237	2.42	0.67
6	RSI are prevalent in GRIDCo	0	0.0	0	0.0	50	51.0	35	35.7	13	13.3	355	3.62	0.71
7	Cardiac arrest arising from electrical shocks	60	61.2	35	35.7	3	3.1	0	0.0	0	0.0	139	1.42	0.55

Group mean 189.00 Source: Field Survey, 2013

0.71. Thus, 49% of the respondents were certain of RSI prevalence in GRIDCo. Effect such as death, fatal disease, absenteeism, fears among workers and cardiac arrest were rejected as outcomes of hazards in GRIDCo.

DISCUSSION

Predominant causes of hazards were mainly human related weaknesses arising out of socio-psychological factors such as negligence, forgetfulness, and dissatisfaction. Other human related causes were related to level of experience of respondents and their ability to manage stress. Further, Poor ready knowledge in fire extinguishing methods puts the organisation in a much critical position should hazard occur. This implies that GRIDCo had fulfilled largely the requirements of the Ghana 1970 Factory and Shops Act, but need to do more in area of workers inexperience. Management needs to focus on human related approaches such as incentives to control behaviour in hazards management. The existence of worker inexperience should call for review of human resource policy on recruitment and training. There were indications of workers awareness as respondents were conscious of the nature, causes and effects of hazards at GRIDCo. However, further investigation to establish the level of awareness revealed low level of ready knowledge on the part of respondents regarding the type of chemicals and liquids used in putting off various types of fires. This may be attributable to forgetfulness or negligence but a situation of this nature is hazardous in itself. Under emergency situation the probability of applying wrong method might worsen the situation. Frequent training of personnel and the use of role-plays would anchor learned information or maximise ready knowledge. Risk assessment should be imbued in the safety practices in the organisation to expose potential dangers.

Management established appreciable level of commitment in dealing with workplace hazards. However, respondents perceived lack of foreign collaboration to deal with hazards and lack of commitment to provision of recreational facilities. Also management was considered to have failed in providing incentives to promote desirable behaviour of workers. The company therefore needs to employ the services of international organisation or collaborate with them for special expertise in hazards prevention. Equally important is adopting the culture of risk assessment on daily basis as well as, health surveillance, regular training and wellness activities such as, aerobics, departmental games, health lectures on stress management and recruitment of clinical psychologist and counsellors to provide supporting services. All these will go a long way to stimulate behaviour towards safety. Repetitive strain injury (RSI) condition such as bodily pains, softening of tissues and nerves are injurious. These injuries according to Bernardi (2003) can have disorders that prevent sufferers from leading normal life. The potential for increase in compensation payments and absenteeism of workers are high as a result of perceived high prevalence of RSI in the company. The RSI in the workplace should therefore be mitigated by the pursuance of ergonomic practices to lessen workplace fatigue in terms of furniture, visual display terminals and working equipment.

Conclusion

Generally, management of workplace hazards in GRIDCo is fairly good. Management showed some appreciable level of commitment in safety, health and welfare matters. However, there is more room for improvement. Management needs to pay attention to socio-psychological factors that has potential of causing hazards. Management commitment to mitigation and worker awareness of hazards must be heightened through appropriate human resource practices. There is also the need for management to consider the use of outside expertise and modern methods in handling hazards.

Recommendation for further studies

Future studies should consider more issues bordering on causes arising from the human nature (socio-psychological factors) since this study had revealed the predominant causes to be human related.

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