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OPTIMISING THE ELEMENTS OF A CONSTRUCTION HEALTH AND SAFETY (H&S) PROGRAMME AND AUDIT SYSTEM

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ABSTRACT

The Master Builders South Africa (MBSA) are reviewing the elements of their national H&S Audit System. Anecdotal evidence and the findings of audits indicates that there should be more focus on risk management and hazard identification and risk assessment. 2013 and 2014 Regional H&S competition award winners were surveyed using a self-administered questionnaire delivered per e-mail to determine perceptions relative to H&S issues and the management of the construction process and activities in general. The salient findings include: hazard identification and risk assessment (HIRA), and risk management are critical; worker participation, H&S education, H&S training, construction H&S management competencies, supervision, management, and construction management competencies are important, and are all predictors of H&S performance, which manifests itself in the physical state of H&S, and 50 / 52 (96.2%) of aspects / interventions / stakeholders contributed to respondents' organisations achieving an H&S competition award. Emphasis should be placed on HIRA assessment, and risk management. Auditing should focus on predictors of H&S performance such as H&S practitioners, hazard identification and risk assessment, and interventions that contribute to a 'healthy' H&S culture, and which result in a 'healthy' H&S climate such as management commitment, supervision, and worker participation, and ultimately lean construction.

Keywords: *audit, competition, construction, health and safety.*

RESUMO

O Master Builders South Africa (MBSA) está analisando os elementos do seu Sistema de Auditoria Nacional de H&S. A evidência e os achados das auditorias indicam que é preciso mais foco na gestão de riscos, identificação de perigos e avaliação de riscos. Nas concorrências de H&S (Saúde e Segurança) Regionais de 2013 e 2014, os vencedores premiados foram analisados utilizando um questionário auto-administrado fornecido por e-mail para determinar as percepções em relação a questões de H&S e a gerência do processo de construção e atividades em geral. Os achados em destaque incluem: Saúde e Segurança e a avaliação de riscos (HIRA) e a gerência de risco são críticas; participação de trabalhadores, educação em Saúde e Segurança (H&S), treino em Saúde e Segurança (H&S), competência na gerência de Saúde e Segurança na construção, supervisão, gerência, e competência na gerência da construção é importante e todos são fatores primários no desempenho de Saúde e Segurança (H&S), que se manifesta-se em si próprio no estado físico de Saúde e Segurança (H&S) e 50/52 (96.2%) dos aspectos/intervenções/partes interessadas contribuíram para organizações respondentes terem alcançado um prêmio na competição de Saúde e Segurança (H&S). A ênfase deve de ser posta na avaliação de risco (HIRA) e na gerência de risco. A auditoria deve focar nos preditores do desempenho de Saúde e Segurança (H&S) tais como profissionais de Saúde e Segurança (H&S), identificação do perigo e avaliação de riscos, e intervenções que contribuem para uma "saúdável" cultura de Saúde e Segurança, a qual resulta num clima "saúdável" de Saúde e Segurança (H&S) tal como compromisso de gerência, supervisão, participação de trabalhadores, e por fim numa construção magra.

Palavras-chave: auditoria, competição, construção, Saúde e Segurança (H&S).

1 INTRODUCTION

The Master Builders South Africa (MBSA) has a national H&S Audit System, which is used to assess contractors in terms of H&S performance, either during initial, general, H&S star grading, or H&S competition assessments. The rationale for the study reported on is that the author was approached to assist with respect to the review in terms of research to identify where the focus of such an H&S Audit System should be, the reason being that although audits focus on the physical aspects of construction, there is concern that there is too much focus on administration. Furthermore, anecdotal evidence, the findings of audits, and various research studies indicate that there should be more focus on risk management and hazard identification and risk assessment.

There is a total of 918 possible points across nineteen elements in the current H&S Audit System. ‘Administrative and Legal Requirements’ entails a possible 156 points, which equates to 17% of the total possible points. Then, although it is a very important aspect of an H&S programme, ‘Education, Training and Promotion’ only entails a possible 25 points, which equates to 0.3% of the total possible points. Then, in terms of risk being mentioned *per se* there are a possible: 5 points relative to ‘CR 7: Hazard Identification and Risk Assessments’; 3 points relative to ‘CR 27: Fire Precautions’, and 2 points relative to ‘Mobile Cranes’. Furthermore, in terms of indirect or implicit reference to risk being mentioned there is / are a possible: 1 point relative to ‘Ergonomics’; 1 point relative to ‘Noise’, and 4 points relative to ‘Site vehicles’ (Pre-ignition checks).

Given the aforementioned, a study ‘Optimising the Elements of a Construction Health and Safety (H&S) Programme and Audit System’ was conducted, the objectives of the study being to determine the:

- Perceived importance of eleven aspects of an H&S programme as posed to respondents;
- Perceived extent to which aspects / interventions / stakeholders contributed to respondents’ organisations achieving an H&S competition award, and
- Perceptions relative to H&S issues and the management of the construction process and activities in general.

2 REVIEW OF THE LITERATURE

2.1 Causes of poor health and safety performance

According to the Construction Industry Development Board (cidb) (2009), poor construction H&S performance at organisational and site level is attributable to a lack of management commitment, inadequate supervision, and inadequate or a lack of H&S training. Furthermore, poor performance is also contributed to by a lack of workers’ involvement, personal risk appreciation, and work pressure. Peterson, Reynolds and Ng (2008) in turn contend that the high accident rate of the construction industry is a result of the poor attitude of construction professionals as well as their lack of knowledge with regards to H&S and risk management practices. The aforementioned highlight the importance of H&S education and training and risk assessment.

2.2 Improving health and safety

Management and leadership at all levels are crucial to improve construction H&S in South Africa (cidb, 2009). The cidb (2009) also states that H&S relevant education and training, or lack thereof, at all levels, has a major impact on construction H&S. At the tertiary level, not all construction related programmes in South Africa include H&S within their curricula. At the site level, studies suggest that about 18% of site supervisors and about 33% of site workers have not received any H&S training. Clearly, attention needs to be given to improve on-site supervision and H&S education and training in order to realise an improvement in construction H&S. A study conducted by Dejus and Antucheviciene (2013), which determined that education and training of construction workers is the main area of focus to mitigate the risk of H&S risk occurrence, underscores the aforementioned contention.

The role of training and awareness is further highlighted by a United Kingdom (UK) construction company, namely Frank Haslam Milan (FHm). Although they had an above average H&S record in 2002, they achieved their goal of zero accidents through a training and awareness initiative involving its employees (Pollitt, 2006). According to the Human Resources Manager, Irene Liddle, they realised they had to raise H&S awareness throughout the company and ensure that everyone, from director to subcontractor, was highly competent in general H&S issues. Furthermore, the fact that employees are increasingly contributing their own ideas to improve H&S as a result thereof, as opposed to simply following management's H&S instructions, amplifies the value of worker participation in H&S (Pollitt, 2006).

The London 2012 Olympic Park site in east London constituted a major challenge and amplified the need for client leadership as the workforce peaked at 12 000 and a total of 30 000 people will have worked on the project through its lifetime. However, through careful planning, implementation of strategies with a proven track record and clear leadership, the Olympic Delivery Authority (ODA) managed to achieve an accident frequency rate comparable to the average for all British employment, significantly better than the construction sector. The H&S programme included five key elements. Safety – clear policies, risk assessments, method statements, common standards, visual standards, daily activity briefings. Health – pre-employment medical checks, prevention programme, assessment and control, health surveillance, training, emergency response. Well-being – advice, well man / woman clinics, good food strategy, campaigns, sexual health clinics, partnerships. Competence – induction, training, supervisor academy, briefings, apprenticeships, checks and records. Culture – leadership, action plans, near-miss reporting, communications, reward and recognition, climate tool.

The role of management commitment is well documented in the literature. According to the Health & Safety Executive (HSE) (2002), it has been proven that well-managed companies achieve high H&S standards because it is an integral part of the management task. Strong, visible management commitment is crucial for good H&S performance. However, although including H&S at the top of board meeting agendas is important, directors and senior managers need to reflect the importance of H&S through their behaviour in addition to what they say. A key management task is communication – specifically communicating the organisation's H&S goals clearly to all employees. Furthermore, the HSE believes that H&S should be integrated with the other training that workers receive as doing so communicates that H&S is an integral aspect of all tasks. The HSE also refers to risks and states that some major projects now operate a risk register, where all the risks are set out and quantified along with the steps taken to

mitigate them and questions whether the use of risk registers should be developed further.

A number of recommendations arose from a study conducted among general contractors in Kwazulu-Natal, a province of South Africa (Othman, 2012): contractors should be more proactive in terms of implementing H&S plans through the integration of H&S procedures into the overall management of projects; contractors must ensure that their labour force is properly trained for their specific tasks; contractors should continuously brief their labour force to maintain proper H&S procedures through repetitive teaching, and contractors should appoint H&S Officers to continuously identify and evaluate the shortcomings of their H&S plans, implement novel solutions, ensure compliance with H&S regulations, and provide the necessary H&S induction. It should be noted that the appointment of H&S Officers is a requirement in terms of the South African Construction Regulations.

3 RESEARCH

3.1 Research method

The 2013 and 2014 Kwazulu-Natal Master Builders Association (KZNMBA) competition award winners were initially surveyed, then the Master Builders Association Western Cape (MBAWC) competition award winners, and then the 2013 East Cape Master Builders Association (ECMBA) competition award winners, using a self-administered questionnaire delivered per e-mail. A total of eleven (11) responses were included in the analysis of the data – seven (7) KZNMBA, two (2) MBAWC, and two (2) ECMBA.

3.2 Research findings

Table 8 indicates the importance of eleven aspects of an H&S programme in terms of achieving optimum H&S in respondents' organisations on a scale of 1 (not important) to 5 (very important), and a MS ranging between 1.00 and 5.00. It is notable that all the MSs are above the midpoint score of 3.00, which indicates that in general the respondents perceive the aspects as important in terms of achieving optimum H&S in their organisations. However, given that all the MSs $> 4.20 \leq 5.00$, the respondents can be deemed to perceive them to be between more than important to very important / very important. It is notable that hazard identification and risk assessment, and risk management are ranked joint first with a MS of 5.00, followed closely by administration and legal requirements. The latter in turn is followed closely by a cluster of five aspects ranked joint fourth with a MS of 4.82. It is notable that administration and legal requirements is ranked marginally ahead of physical aspects (MS = 4.82), as the prevailing contention in industry is that the physical aspects are more important. Then, whereas worker participation, one of the 'two pillars of an H&S programme', is ranked joint fourth with a MS of 4.82, the other pillar, management is ranked tenth with a MS of 4.64. Supervision is ranked marginally ahead of management with a MS of 4.73. This reflects the reality on site, namely that supervisors supervise the physical construction activities. H&S education, H&S training, and construction H&S management competencies were also ranked joint fourth (MS = 4.82), whereas construction management competencies is ranked eleventh with a MS of 4.45. In essence, all the aspects achieved high MSs.

Table 8 - Degree of importance of aspects of an H&S programme in terms of achieving optimum H&S in respondents' organisations

Aspect	Response (%)						MS	Rank
	Un sure	Not.....V ery						
		1	2	3	4	5		
Hazard identification and risk assessment	0.0	0.0	0.0	0.0	0.0	100.0	5.00	1=
Risk management	0.0	0.0	0.0	0.0	0.0	100.0	5.00	1=
Administration and legal requirements	0.0	0.0	0.0	0.0	9.1	90.9	4.91	3
Physical aspects	0.0	0.0	0.0	0.0	18.2	81.8	4.82	4=
Worker participation	0.0	0.0	0.0	0.0	18.2	81.8	4.82	4=
H&S education	0.0	0.0	0.0	0.0	18.2	81.8	4.82	4=
H&S training	0.0	0.0	0.0	0.0	18.2	81.8	4.82	4=
Construction H&S management competencies	0.0	0.0	0.0	0.0	18.2	81.8	4.82	4=
Supervision	0.0	0.0	0.0	0.0	27.3	72.7	4.73	9
Management	0.0	0.0	0.0	0.0	36.4	63.6	4.64	10
Construction management competencies	0.0	0.0	0.0	0.0	54.5	45.5	4.45	11

Table 9 indicates the extent to which aspects / interventions / stakeholders contributed to respondents' organisations achieving an H&S competition award on a scale of did not and between 1 (minor) to 5 (major), and a MS ranging between 0.00 and 5.00. It is significant that 50 / 52 (96.2%) of the MSs are above the midpoint score of 2.50, which indicates that the aspects / interventions / stakeholders can be deemed to have contributed to respondents' organisations achieving an H&S competition award.

It is notable that 36 / 52 (69.2%) of the MSs are $> 4.17 \leq 5.00$, which indicates the aspects / interventions / stakeholders contributed to respondents' organisations achieving an H&S competition award between a near major extent to a major extent / major extent. Six interventions / stakeholders are ranked joint first with a MS of 4.82: H&S Coordinator / Manager; H&S Officer; hazard identification and risk assessment; H&S induction; H&S training, and toolbox talks. These are followed by joint seventh ranked H&S management system (H&SMS) and H&S education (MS = 4.73) and joint ninth ranked focus on H&S and H&S awareness (MS = 4.64). The aforementioned constitute the top ten. Other notable aspects / interventions / stakeholders within this upper range ($> 4.17 \leq 5.00$) are H&S culture, H&S Representatives, safe work procedures (SWPs), H&S measurement, allocation of financial resources to H&S, H&S plans, first line supervision, site management, H&S goal setting, management commitment to H&S, integration of H&S into all activities / tasks, management involvement in H&S, Quality Management System (QMS), management accountability for H&S, and worker participation.

The aspects / interventions / stakeholders ranked thirty-seventh (37th) to forty-sixth (46th) have MSs $> 3.33 \leq 4.17$, which indicates they can be deemed to have contributed to respondents' organisations achieving an H&S competition award between some

extent to a near major extent / near major extent. Notable aspects / interventions / stakeholders within this range include H&S specification, client, medical surveillance, project manager, client appointed H&S Agent, and partnering.

4 / 52 (7.7%) MSs fall within the range $> 2.50 \leq 3.33$, which indicates the aspects / interventions / stakeholders can be deemed to have contributed to respondents' organisations achieving an H&S competition award between a near minor extent to some extent /some extent. Improvement process e.g. Total Quality Management (TQM) is one of the four.

The MS of designers falls within the range $> 1.70 \leq 2.50$, which indicates it can be deemed to have contributed to respondents' organisations achieving an H&S competition award between a minor to near minor / near minor extent.

Table 9 - Extent to which aspects / interventions / stakeholders contributed to respondents' organisations achieving an H&S competition award

Aspect / Intervention / Stakeholder	Response (%)							MS	Rank
	Un sure	Did not	MinorMajor						
			1	2	3	4	5		
H&S Coordinator / Manager	0.0	0.0	0.0	0.0	0.0	18.2	81.8	4.82	1=
H&S Officer	0.0	0.0	0.0	0.0	0.0	18.2	81.8	4.82	1=
Hazard identification and risk assessment	0.0	0.0	0.0	0.0	0.0	18.2	81.8	4.82	1=
H&S induction	0.0	0.0	0.0	0.0	0.0	18.2	81.8	4.82	1=
H&S training	0.0	0.0	0.0	0.0	0.0	18.2	81.8	4.82	1=
Toolbox talks	0.0	0.0	0.0	0.0	0.0	18.2	81.8	4.82	1=
H&S management system (H&SMS)	0.0	0.0	0.0	0.0	0.0	27.3	72.7	4.73	7=
H&S education	0.0	0.0	0.0	0.0	0.0	27.3	72.7	4.73	7=
Focus on H&S	0.0	0.0	0.0	0.0	9.1	18.2	72.7	4.64	9=
H&S awareness	0.0	0.0	0.0	0.0	9.1	18.2	72.7	4.64	9=
H&S culture	0.0	0.0	0.0	0.0	9.1	27.3	63.6	4.55	11=
H&S Representatives	0.0	0.0	0.0	0.0	9.1	27.3	63.6	4.55	11=
Safe work procedures (SWPs)	0.0	0.0	0.0	0.0	9.1	27.3	63.6	4.55	11=
Feedback on H&S performance	0.0	0.0	0.0	0.0	9.1	27.3	63.6	4.55	11=
Construction Regulations	0.0	0.0	0.0	0.0	9.1	27.3	63.6	4.55	11=
Participation in H&S competitions	0.0	0.0	0.0	0.0	9.1	27.3	63.6	4.55	11=
Participation in H&S star gradings	0.0	0.0	0.0	0.0	9.1	27.3	63.6	4.55	11=
H&S measurement	0.0	0.0	0.0	9.1	0.0	18.2	72.7	4.55	18
Allocation of financial resources to H&S	0.0	0.0	0.0	0.0	9.1	36.4	54.5	4.45	19=
H&S inspections	0.0	0.0	0.0	0.0	9.1	36.4	54.5	4.45	19=
H&S rules	0.0	0.0	0.0	0.0	18.2	18.2	63.6	4.45	21=
H&S notice board	0.0	0.0	0.0	0.0	18.2	18.2	63.6	4.45	21=
H&S legislation (OH&S Act & COID Act)	0.0	0.0	0.0	0.0	18.2	18.2	63.6	4.45	21=
H&S plans	0.0	0.0	0.0	9.1	0.0	27.3	63.6	4.45	24
First line supervision	0.0	0.0	0.0	9.1	9.1	9.1	72.7	4.45	25
H&S policy	0.0	0.0	0.0	0.0	18.2	27.3	54.5	4.36	26
Site management	0.0	0.0	0.0	9.1	0.0	36.4	54.5	4.36	27
H&S goal setting	0.0	0.0	0.0	9.1	9.1	18.2	63.6	4.36	28
Management commitment to H&S	0.0	0.0	0.0	0.0	27.3	18.2	54.5	4.27	29=

H&S meetings	0.0	0.0	0.0	0.0	27.3	18.2	54.5	4.27	29=
Integration of H&S into all activities / tasks	9.1	0.0	0.0	9.1	0.0	0.0	81.8	4.27	31
Management involvement in H&S	0.0	0.0	0.0	0.0	36.4	0.0	63.6	4.27	32=
Quality management system (QMS)	0.0	0.0	0.0	9.1	9.1	27.3	54.5	4.27	32=
Recognition of H&S performance	9.1	0.0	0.0	0.0	9.1	18.2	63.6	4.18	34
Management accountability for H&S	0.0	0.0	0.0	0.0	27.3	27.3	45.5	4.18	35
Worker participation	9.1	0.0	0.0	9.1	0.0	9.1	72.7	4.18	36
H&S specification	0.0	0.0	0.0	18.2	9.1	18.2	54.5	4.09	37
Client	0.0	0.0	0.0	18.2	9.1	27.3	45.5	4.00	38
Incident investigation	0.0	9.1	0.0	0.0	18.2	18.2	54.5	4.00	39
H&S disciplinary procedure	9.1	0.0	0.0	9.1	18.2	0.0	63.6	3.91	40
Medical surveillance	9.1	0.0	0.0	0.0	27.3	27.3	36.4	3.73	41
Project manager	0.0	0.0	0.0	18.2	36.4	9.1	36.4	3.64	42
H&S message / theme for the month or week	9.1	0.0	9.1	0.0	18.2	18.2	45.5	3.64	43
Client appointed H&S Agent	0.0	9.1	0.0	9.1	27.3	18.2	36.4	3.55	44
H&S incentives	9.1	9.1	0.0	0.0	18.2	18.2	45.5	3.55	45
Partnering	0.0	12.5	0.0	12.5	12.5	25.0	37.5	3.50	46
Improvement process e.g. Total Quality Management (TQM)	18.2	0.0	0.0	18.2	0.0	27.3	36.4	3.27	47
H&S Consultant	0.0	18.2	0.0	18.2	27.3	9.1	27.3	2.91	48
H&S newsletter	0.0	18.2	9.1	9.1	27.3	9.1	27.3	2.82	49
H&S suggestion box	9.1	18.2	9.1	0.0	18.2	18.2	27.3	2.73	50
Designers	0.0	27.3	18.2	18.2	18.2	0.0	18.2	2.00	51
Unions	0.0	54.5	36.4	0.0	0.0	9.1	0.0	0.73	52

4 CONCLUSIONS

Although all eleven aspects of an H&S programme as posed to the respondents are important in terms of achieving optimum H&S in respondents' organisations, the high ranking of hazard identification and risk assessment, and risk management, leads to the conclusion that these are critical, and that emphasis should be placed on these aspects during auditing. Then, although administration and legal requirements are marginally more important than the physical aspects, there is a high level of agreement with 'The emphasis in terms of H&S should be on the physical aspects'. The relatively high agreement with 'Too much administration results in ticking boxes and cutting and pasting', 'Too much administration is required relative to H&S to the detriment of the physical aspects of H&S', and 'Too much administration is required relative to H&S' is tempered by the agreement with 'Administration provides the basis for addressing the physical aspects of H&S'. Therefore it can be concluded that auditing should focus on the physical process, but also give the administration process the requisite attention. However, the importance of worker participation, H&S education, H&S training, construction H&S management competencies, supervision, management, and construction management competencies introduces a further dimension. Firstly, H&S education and H&S training influence the others, and in turn management commitment influences the degree of H&S education and H&S training. Secondly, they are all predictors of H&S performance, which manifests itself in the physical state of H&S. Therefore, it can be concluded that auditing should focus on such predictors. This conclusion is reinforced by the level of agreement with 'H&S management is an integral part of construction management', 'There should be more focus on management

involvement in H&S’, ‘There should be more focus on supervision’s role in H&S’, and ‘There should be more focus on management accountability for H&S’.

The finding that 50 / 52 (96.2%) of aspects / interventions / stakeholders contributed to respondents’ organisations achieving an H&S competition award to a major as opposed to a minor extent, leads to the conclusion that a multi-content ‘cocktail’ is required to optimise H&S performance. However, H&S practitioners, hazard identification and risk assessment, and interventions that contribute to a ‘healthy’ H&S culture, and which result in a ‘healthy’ H&S climate, are critical. Included in the aforementioned are management commitment, supervision, and worker participation. Therefore, it can be concluded that auditing should focus on such predictors.

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