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THE PERFORMANCE OF CONSTRUCTION HEALTH AND SAFETY AGENTS

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Clients may appoint construction health and safety agents (CHSAs) in terms of fulfilling their requirements in terms of the South African Construction Regulations. Previous research findings and anecdotal evidence indicate that CHSAs are lacking in terms of performance. However, due to the recent requirement for CHSAs to register, research findings relative to their performance are limited. The objectives of the study were to determine the performance of CHSAs, and barriers to CHSAs' contribution to construction and construction health and safety (H&S). Registered CHSAs constituted the sample stratum, and were subjected to an e-mail delivered self-administered questionnaire survey. The salient findings include: CHSAs are generally appointed during project initiation and briefing, tender documentation and procurement, and construction documentation and management; CHSAs have contributed to and impacted on H&S; a range of factors constitute a barrier to CHSAs contributing to H&S, particularly inadequate knowledge and experience; CHSAs rate themselves as good relative to most composite knowledge areas and composite skills areas; the contribution of CHSAs to H&S could be improved, and a range of interventions could contribute to an improvement in the contribution of CHSAs to H&S. Conclusions include: CHSAs may not be viewed as being able to contribute during project initiation and briefing, concept and feasibility, and design development; CHSAs have contributed to and impacted on H&S; inadequate knowledge and experience due to a lack of appropriate tertiary education lead to their limited status, exclusion from decision making and management of the project, and not being consulted.

Keywords: South Africa, Construction regulations, Questionnaire survey, Performance improvement.

1 INTRODUCTION

The Construction Industry Development Board (CIDB) (2009) industry report 'Construction Health & Safety Status & Recommendations' highlighted the significant number of accidents, fatalities, and other injuries that are prevalent in the construction industry. These are attributed to a lack of compliance with H&S legislative requirements, which is indicative of a deficiency of effective management and supervision of H&S on construction sites as well as in planning from the inception / conception of projects within the context of project management (CIDB 2009). It is also evident that there is a lack of sufficiently skilled, experienced, and knowledgeable persons to manage H&S on construction sites (CIDB 2009).

The Construction Regulations make provision for the appointment of Construction H&S Agents (CHSAs) (Republic of South Africa 2014). The CIDB (2009) report 'Construction Health & Safety Status & Recommendations' highlighted the need for professional registration of

construction H&S practitioners due to, *inter alia*, the finding that there was a lack of competencies, and no formal registration process. The Council for the Built Environment (CBE) in terms of Act No. 48 (Republic of South Africa 2000) to register construction H&S professionals then mandated the South African Council for the Project and Construction Management Professions (SACPCMP). This in turn led to the identification of three such categories of registration, one being the Professional Construction Health and Safety Agent (Pr CHSA). Registration rules were then gazetted for these three categories for commencement 1 June 2013 in the case of Pr CHSA. Given the findings in the CIDB report 'Construction Health & Safety Status & Recommendations' (2009), other ad-hoc research findings, anecdotal evidence, an exploratory study, a follow up study was conducted to determine, *inter alia*:

- The performance of CAH&SAs;
- Barriers to CAH&SAs' contribution to construction and construction H&S, and
- Interventions that could contribute to an improvement in the contribution of CHSAs to H&S.

2 THE REVIEW OF THE LITERATURE

2.1 Legislation and Regulations

The amended Construction Regulations (Republic of South Africa 2014) lay down important requirements with respect to clients and designers.

However, where a construction work permit is required a client must appoint a competent person in writing as an agent. Where notification of construction work is required the client may appoint a competent person in writing as an agent. However, an agent must manage the H&S on a construction project, and be registered with a statutory body. Clearly the requirements of clients are onerous given that they are invariably not built environment professionals or H&S professionals.

Given the requirements of clients and designers and the indirect requirements of clients because of the designer requirements, CHSAs require a range of knowledge and skills.

2.2 Knowledge and Skills Areas

Upon application to register as a CHSA, the SACPCMP requires a report that addresses the following nine knowledge areas: Procurement Management; Cost Management; Hazard Identification Management; Risk Management; Accident or Incident Investigation Management; Legislation and Regulations; Health, Hygiene and Environmental Management; Communication Management, and Emergency Preparedness Management (SACPCMP 2013a).

In terms of the CHSA Scope of Services, CHSAs are expected to be experienced and knowledgeable relative to the following areas: construction project H&S management systems; construction H&S management; construction H&S performance measurement and monitoring, and construction H&S continual improvement (SACPCMP 2013b).

3 RESEARCH

3.1 Research Method

The descriptive survey method was adopted to gather the data obtained through an e-mail delivered self-administered questionnaire circulated to 40 registered CHSAs. The questionnaire consisted of 22 questions, 21 of which were close ended, one being open ended. Furthermore, 10

of the 21 close-ended questions were five or six point Likert scale type questions. 14 Questionnaires were returned out of 40 circulated, which equates to a response rate of 35%. The length of the questionnaire probably militated against a healthy response rate. A measure of central tendency in the form of a mean score (MS) was computed to enable ranking and comparisons. The weightings relative to the five-point scale were as per the scale i.e. 1 relative to one, 2 relative to 2, and thereafter accordingly, resulting in a MS between 1.00 and 5.00. Certain questions required a sixth point due to either a 'have not', 'does not', or 'will not', which was weighted 0, resulting in a MS between 0.00 and 5.00.

3.2 Research Findings

Table 1 indicates the frequency at which CHSAs are appointed relative to the six stages of projects as per the respective statutory councils in South Africa. 27.3% of respondents identified each of Stage 1 'Project initiation and briefing', Stage 2 'Tender documentation and procurement' (42.9%), and Stage 3 'Construction documentation and management', followed by Stage 3 'Design development'. Ideally CHSAs should be appointed at Stage 1 'Project initiation and briefing', or at the latest Stage 2.

Table 1. Stage at which CHSAs are generally appointed.

Stage	**Yes (%)**
1. Project initiation and briefing	27.3
2. Concept and feasibility	0
3. Design development	18.1
4. Tender documentation and procurement	27.3
5. Construction documentation and management	27.3
6. Project close out	0

Table 2 indicates the extent to which CHSAs have contributed to and impacted on H&S in terms of percentage responses to a scale of have not, and 1 (minor) to 5 (major), and a mean score (MS) between 0.00 and 5.00. Given that the MSs are > 2.50, the contribution and impact is major as opposed to minor. However, in terms of MS ranges, the MSs are > 3.34 ≤ 4.17, therefore the contribution and impact is between moderate to near major / near major.

Table 2. Extent to which CHSAs have contributed to and impacted on H&S.

Aspect	**Unsure**	**Have not**	**Minor ····· Major**					**MS**
			1	**2**	**3**	**4**	**5**	
Contributed	0.0	21.4	0.0	14.3	28.6	28.6	7.1	3.36
Impacted	7.1	21.4	0.0	7.1	35.7	21.4	14.3	3.55

Table 3 indicates the extent to which factors constitute a barrier to CHSAs contributing to H&S in terms of percentage responses to a scale of does not, and 1 (minor) to 5 (major), and MSs between 0.00 and 5.00. It is notable that all factors have MSs > 2.50, which indicates that all the factors constitute a major as opposed to a minor barrier.

It is notable that no MSs are > 4.17 ≤ 5.00 i.e. near major to major / major barrier. However, 13 / 15 (86.7%) factors have MSs > 3.33 ≤ 4.17, which indicates they constitute a barrier to CHSAs contributing to H&S between some extent to a near major / near major extent. 'Inadequate construction H&S knowledge' (MS = 3.86), 'Late participation in the project' (MS =

3.86), and 'Non-consultation by project management / principal agent' (MS = 3.85) are ranked first to third. Six factors are inadequate knowledge or experience related.

The MSs of the remaining 2 factors (13.3%) are > 2.50 ≤ 3.33, which indicates the factors constitute a barrier to CHSAs contributing to H&S between a near minor extent to some extent.

Table 3. Extent to which factors constitute a barrier to CHSAs contributing to H&S.

Factor	Response (%)							MS	Rank
	Unsure	Does not	Minor ……Major 1	2	3	4	5		
Inadequate construction H&S knowledge	0.0	7.1	0.0	7.1	14.3	28.6	42.9	3.86	1
Late participation in the project	0.0	0.0	0.0	14.3	21.4	28.6	35.7	3.86	2
Non-consultation by project management / principal agent	7.1	7.1	0.0	7.1	14.3	21.4	42.9	3.85	3
Inadequate construction H&S experience	0.0	7.1	0.0	7.1	14.3	35.7	35.7	3.79	4
Exclusion from decision making	7.1	0.0	0.0	14.3	28.6	14.3	35.7	3.77	5
Inadequate knowledge of the construction process	0.0	0.0	7.1	7.1	21.4	35.7	28.6	3.71	6
Inadequate resources	0.0	0.0	0.0	21.4	28.6	28.6	21.4	3.50	7
Exclusion from management of project	0.0	7.1	0.0	14.3	21.4	28.6	28.6	3.50	8
Status level	15.4	7.7	0.0	0.0	38.5	15.4	23.1	3.45	9
Inadequate construction management knowledge	0.0	0.0	7.1	7.1	35.7	35.7	14.3	3.43	10
Inadequate construction process experience	0.0	0.0	14.3	7.1	14.3	50.0	14.3	3.43	11
Lack of authority	0.0	7.1	7.1	21.4	7.1	14.3	42.9	3.43	12
Inadequate construction management experience	0.0	7.7	0.0	7.7	38.5	23.1	23.1	3.38	13
Inadequate construction activities experience	0.0	0.0	14.3	14.3	28.6	21.4	21.4	3.21	14
Inadequate knowledge of construction activities	0.0	0.0	7.1	35.7	7.1	42.9	7.1	3.07	15

Respondents were required to rate themselves in terms of eight composite knowledge areas on a scale of 1 (very poor) to 5 (very good), and a MS between 1.00 and 5.00. 3 / 8 (37.5%) of the MSs are > 4.20 ≤ 5.00, which indicates the rating is good to very good / very good – H&S, planning, and law. 4 / 8 (50%) have MSs > 3.40 ≤ 4.20, which indicates the rating is average to good / good – project administration, management / management of parameters, financial management, and construction technology / technology. The MS of the last ranked composite knowledge areas (25%) is > 2.60 ≤ 3.40, indicating the rating is poor to average/average - design.

Respondents were also required to rate themselves in terms of seven composite skills areas on a scale of 1 (very poor) to 5 (very good), and a MS between 1.00 and 5.00. 4 / 7 (57.1%) of the MSs are > 4.20 ≤ 5.00, which indicates the rating is good to very good / very good – general management, leadership, planning, and negotiating. 3 / 7 (42.9%) have MSs > 3.40 ≤ 4.20, which indicates the rating is average to good / good – financial, interpersonal / developmental, and technical. It is notable that the self-rated MSs are all higher than those accorded to CHASs during a study conducted among construction project managers (CPMs) relative to the performance of CHSAs (Smallwood 2015).

Respondents were required to indicate the extent to which the contribution of CHSAs to H&S could be improved on a scale of 1 (minor) to 5 (major), and a MS between 1.00 and 5.00. The

4.38 MS, which is > 4.20 ≤ 5.00, indicates the extent to which the contribution could be improved is between a near major extent to major / major extent.

Table 4 indicates the extent to which interventions could contribute to an improvement in the contribution of CHSAs to H&S in terms of percentage responses to a scale of will not, and 1 (minor) to 5 (major), and MSs between 0.00 and 5.00. It is notable that all the interventions have MSs > 2.50, which indicates that all the interventions have the potential to contribute to a major as opposed to a minor extent.

It is notable that 11 / 15 (73.3%) of the MSs are > 4.17 ≤ 5.00 i.e. between a near major to major / major extent. It is notable that the first four interventions are 'increased consultation by project management / principal agent', 'inclusion in planning activities', and 'participation in the early stages of projects', and 'inclusion in decision making'. 'Inclusion in the management of projects' is ranked sixth, and 'optimum position in projects' hierarchies' is ranked eighth. 'Formal CHSA qualification' is ranked fifth, and then four education / training related interventions are ranked seventh, and ninth to eleventh.

4 / 15 (26.7%) interventions have MSs > 3.33 ≤ 4.17, which indicates they have the potential to contribute between some extent to a near major / near major extent.

Table 4. Extent to which interventions could contribute to an improvement in the contribution of CHSAs to H&S.

Intervention	Response (%)							MS	Rank
	Un sure	Will not	Minor 1	2	3	4	Major 5		
Increased consultation by project management / principal agent	0.0	0.0	0.0	0.0	7.1	28.6	64.3	4.57	1
Inclusion in planning activities	0.0	0.0	0.0	0.0	14.3	14.3	71.4	4.57	2
Participation in the early stages of projects	0.0	0.0	0.0	0.0	21.4	0.0	78.6	4.57	3
Inclusion in decision making	0.0	0.0	0.0	0.0	0.0	50.0	50.0	4.50	4
Formal CHSA qualification	0.0	0.0	0.0	0.0	0.0	53.8	46.2	4.46	5
Inclusion in the management of projects	0.0	0.0	0.0	0.0	21.4	21.4	57.1	4.36	6
Education / Training relative to construction H&S	0.0	0.0	7.1	0.0	0.0	35.7	57.1	4.36	7
Optimum position in projects' hierarchies	0.0	0.0	0.0	7.1	14.3	21.4	57.1	4.29	8
Education / Training relative to construction activities	0.0	0.0	0.0	0.0	14.3	50.0	35.7	4.21	9
Education / Training relative to project management	0.0	0.0	0.0	0.0	21.4	35.7	42.9	4.21	10
Education / Training relative to construction management	0.0	0.0	0.0	0.0	21.4	35.7	42.9	4.21	11
Education / Training relative to the design process	0.0	0.0	0.0	0.0	21.4	42.9	35.7	4.14	12
Education / Training relative to the construction process	0.0	0.0	0.0	7.1	14.3	42.9	35.7	4.07	13
Increased authority	0.0	0.0	0.0	7.1	14.3	42.9	35.7	4.07	14
Optimum resources	0.0	0.0	0.0	0.0	28.6	42.9	28.6	4.00	15

4 CONCLUSIONS

CHSAs are mostly appointed during Stages 4 and 5, which does not enable them to influence construction H&S through design. This leads to the conclusion that they may not be viewed as being able to contribute during these stages, which the other findings underscore. Furthermore,

clients and / or principal agents may not view consideration of H&S during the earlier stages as necessary, or of value.

CHSAs have contributed to and impacted on H&S, which leads to the conclusion that they have a role to play relative to construction H&S, and that their creation courtesy of the Construction Regulations is vindicated.

A range of factors constitute a barrier to CHSAs contributing to H&S, particularly inadequate knowledge and experience, which in turn leads to their limited status, exclusion from decision making and management of the project, and not being consulted, all of which are also barriers.

Although CHSAs rate themselves quite high, relative to eight composite knowledge areas, and seven composite skills areas, the finding that the contribution of CHSAs to H&S could be improved, and that a range of interventions could contribute to an improvement in the contribution of CHSAs to H&S, particularly education and training relative to various aspects, indicates a need for developmental interventions.

A limitation is that there were only fourteen respondents included in the study. However, there are only forty registered CHSAs in South Africa.

However, the identification of the stages at which CHSAs have been mostly appointed, the barriers to their contributing to H&S, that a range of interventions could contribute to an improvement in their contribution to H&S, has contributed to the closing of the gap in knowledge, and the related body of knowledge.

5 RECOMMENDATIONS

Given the potential of a formal CHSA qualification, and a range of education / training related interventions in terms of contributing to an improvement in the contribution of CHSAs to H&S, CHSAs should register for and complete formal tertiary education programs that empower them in terms of construction economics, management, H&S, and science and technology as well as design management, procurement management, and project management. Continuing professional development (CPD) courses should be evolved relative to these subject areas.

CHSAs should be appointed at Stage 1 'Project initiation and briefing' and obviously during Stage 2 'Concept and feasibility', and Stage 3 'Design development'. The completion of appropriate tertiary education programs and CPD will enable CHSAs to contribute at these stages.

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