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Construction

Health & Safety in South Africa

Status & Recommendations

ACKNOWLEDGEMENTS

This report draws extensively on a research report undertaken by Construction Research Education and Training Enterprises (CREATE) that was commissioned by the cidb.
The support of the researchers is gratefully acknowledged:

- Prof John Smallwood;
- Prof Theo Haupt; and
- Prof Winston Shakantu.

EXECUTIVE SUMMARY

Construction health and safety (H&S) has long been the focus of attention of many industry stakeholders and role players in South Africa, and while it is acknowledged that many industry associations and professional societies, contracting organisations and others have made significant efforts to improve H&S within the construction industry, overall construction H&S is not improving commensurately. Notably, construction continues to contribute a disproportionate number of fatalities and injuries relative to other industrial sectors, and there continues to be high levels of non-compliance with H&S legislation generally, and specifically the construction and other H&S Regulations in South Africa.

Improving H&S in the construction industry therefore continues to remain a priority - including being a priority for the cidb. Against this context, the cidb has undertaken this report on the status of construction H&S in South Africa, so as to provide a context for the efforts and actions of industry stakeholders and role players in improving construction H&S. However, given that priorities change, in the medium to long term, H&S needs to be included as a value in the construction industry.

Drawing on research findings, this report shows that at a legislative level, South Africa is not lacking in terms of H&S legislation. However, while the Construction Regulations have had an impact, the Construction Regulations need to be amended to promote optimum H&S throughout all phases of a project, in particular the concept, initiation and detailed design phases. The report also notes that enforcement of the Construction Regulations is inadequate and that the OH&S Inspectorate is understaffed and lacks the requisite construction expertise. Furthermore, there is a lack of comprehensive construction H&S statistics and the most recent statistics, available from the Compensation Commissioner, are for the year 1999 - and the Compensation Fund is perceived to be "dysfunctional".

At the organisational and site level, poor construction H&S performance is attributable to a lack of management commitment, inadequate supervision and inadequate or a lack of H&S training. A lack of worker involvement, personal risk appreciation and work pressures also contribute to poor performance.

Employer associations namely the MBSA, the respective MBAs and SAFCEC have contributed the most to H&S. Employee associations such as BCAWU, NUMSA and others have contributed sporadically to H&S and then only on high-profile projects. No professional association has championed the discipline of construction H&S on a sustained basis until the recent establishment of ACHASM and this lack of championing has contributed to the lack of professionalism in terms of construction H&S. The tertiary built environment education sector does not adequately address construction H&S and the CETA has not influenced the course of construction H&S training and skills development.

The report also notes that specific attention needs to be given to small and emerging contractors, who typically have limited resources to provide for H&S and whose H&S processes will typically be less structured and based rather on prior contract experience. A developmental approach is needed to support this sub-sector of the industry.

The report then concludes with recommendations for improving construction H&S, including recommendations that the cidb will champion. The recommendations of the report are grouped into the following key areas:

- enhancing the impact of the Construction Regulations;
- using public sector procurement to achieve improvements in construction H&S;
- enhancing the understanding of the status of construction H&S in South Africa through the timeous provision of H&S information and statistics;
- establishing minimum competence standards and accreditation client appointed H&S agents in terms of the Construction Regulations;
- establishing of a 'H&S Agency' as a focus point for the promotion, awareness, information, advice and promotion of research on construction H&S;
- building H&S capacity within relevant unions and facilitating closer working relationships between employers and union members to enhance construction H&S;
- ensuring that tertiary education addresses construction H&S and related issues; and
- facilitating a developmental approach to support the small and emerging contractors.

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INTRODUCTION

Globally, the construction industry has a poor health and safety (H&S) record and South Africa is no exception.

Construction H&S has long been the focus of attention of many industry stakeholders and role players in South Africa, and while it is acknowledged that many industry associations and professional societies, contracting organisations and others have made significant efforts to improve H&S within the construction industry, overall construction H&S is not improving significantly. Notably, construction continues to contribute a disproportionate number of fatalities and injuries and there continues to be a high level of non-compliance with the H&S Regulations in South Africa.

Improving H&S in the construction industry therefore continues to remain a priority - including being a priority for the cidb.

Specifically, the cidb Act No. 38 of 2000 mandates the cidb to determine and establish best practice that promotes, amongst others, positive safety, health and environmental outcomes. The cidb Act also mandates the cidb to establish a Best Practice Contractor Recognition Scheme which:

- enables organs of state to manage risk on complex contracting strategies; and
- promotes contractor development in relation to best practice standards and guidelines developed by the Board.

Furthermore, the cidb Act also mandates the cidb to establish a Best Practice Project Assessment Scheme based on the best practices identified by the Board. All construction contracts above a prescribed tender value will then be subject to an assessment of compliance with best practice standards and guidelines published by the Board.

Against this context, the cidb has undertaken this report on the status of construction H&S in South Africa, so as to provide a context for the efforts and actions of industry stakeholders and role players in improving construction H&S. The report then concludes with recommendations for improving construction H&S, including recommendations that the cidb will champion.

Global H&S performance of construction sector:

- *60 000 fatal accidents - one every ten minutes;*
- *one in every six work-related fatal accidents occurs on a construction site;*
- *in industrialized countries, more than 25% to 40% of work-related deaths occur on construction sites despite the sector only employing between 6% to 10% of total employment;*
- *about 30% of construction workers suffer from back pains or other musculoskeletal disorders; and*
- *there is a 50% higher incidence rate for non-fatal accidents among workers aged 15 to 24 years.*

Adapted from the ILO

OVERVIEW OF CONSTRUCTION HEALTH AND SAFETY IN SOUTH AFRICA

NUMBER AND NATURE OF INJURIES

The starting point in any overview of construction H&S should be an assessment based on statistics.

In terms of the Compensation for Occupational Injuries and Diseases Act No. 130 of 1993 (COID Act), all construction industry employers are required to be registered with either the Compensation Commissioner (housed within the Department of Labour, DoL) or the Federated Employers' Mutual Assurance Company Limited, FEMA, and are required to report occupational injuries within seven days after such injuries occurred, and occupational diseases within fourteen days of diagnosis. H&S statistics in South Africa are then collected by the Compensation Commissioner, which includes statistics from FEMA.

FEMA accounts for about 20% of contractors (predominantly the larger contractors) accounting for about 50% of employees and regularly publishes details of construction H&S claims.

H&S statistics are also collected by the DoL, based on information received from the provinces as per Section 24 of the Occupational Health and Safety Act No. 85 of 1993 (OH&S Act). Construction industry employers report a range of incidents where the H&S of a person is endangered and also the occurrence of occupational diseases to regional offices. The Head Office of the DoL then collates this information and makes this information available to the public.

There are, however, significant difficulties to access and compare some of these construction H&S statistics due to differences in collection and interpretation. For example:

- at the time of writing this report, the most recent H&S statistics available from the Compensation Commissioner are those pertaining to 1999 that are available on their web site;
- FEMA and the Compensation Commissioner includes construction related motor-vehicle accidents in their statistics (which can be extracted), while the DoL statistics do not include construction related motor-vehicle accidents as they are reported to the South African Police Service (SAPS); and
- the DoL H&S statistics are collated from the provinces but these statistics allude to gross under-reporting.

Notwithstanding these difficulties, a useful picture does emerge from the available statistics.

Construction H&S statistics provided by the DoL covering the period 2004/05 to 2007/08 show a sharp rise in accidents up to 2007/08; to around 160 fatalities and around 400 non-fatal accidents (i.e. temporary or permanent disablements)[1]. These statistics reportedly include the FEMA statistics (but excluding motor-vehicle accidents).

Construction Safety Chaos

The Building, Construction and Allied Workers Union (BCAWU) has fingered the labour department's failure to provide a sufficient number of health and safety inspectors as one of the reasons behind the growing number of accidents on construction sites.

"... the department of labour is not cooperative in terms of giving us statistics of cases that are under their investigation."

Labour department spokesperson Sekgothadi Lerotholi refused to provide City Press Gauteng with statistics or reports into construction site accidents.

City Press 09/08/2008

"The South African construction industry needs a 'shift in mindset' to become more health and safety conscious - and improve a situation where at least two workers die in site accidents every week".

Phumudzo Maphaha, Manager of Construction Health & Safety within the National Department of Labour

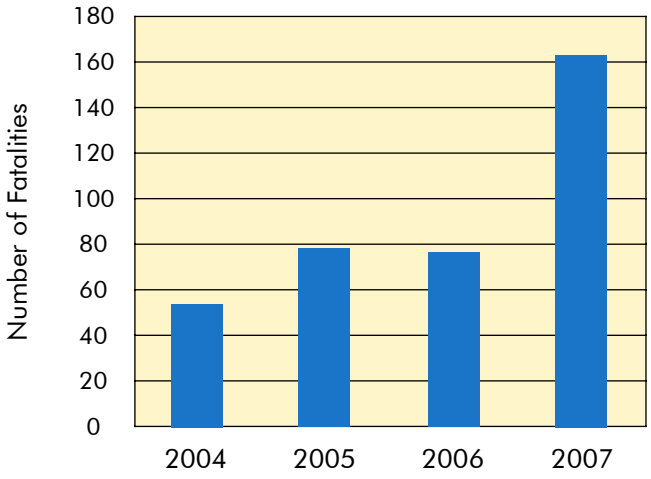
Construction H&S Statistics Excluding Motorvehicle Accidents

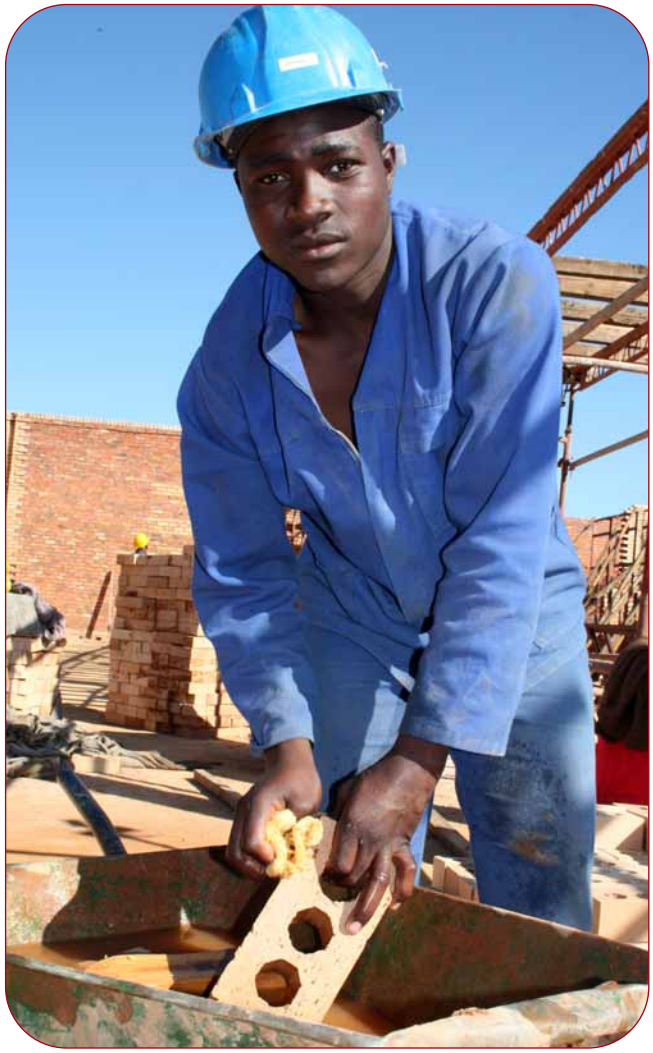
Department of Labour: OH&S				
	2004/05	2005/06	2006/07	2007/08
Fatal	54	81	79	162
Non-fatal	159	250	245	396
Non-casualty	11	7	10	20
Total	224	338	334	578

Source: Department of Labour

According to national statistics drawn from the records of FEMA for 2007[2]:

- 10 231 claims were registered (which is 1047 more than for 2006);
- the amount paid out in claims was R104 million (R7 million less than in 2006); and
- 60 fatalities were registered (14 less than in 2006).





Construction H&S Claims and Fatalities: FEMA

Province	2006		2007	
	Number of Claims	Number of Fatalities	Number of Claims	Number of Fatalities
Gauteng	4 257	32	5 143	30
KwaZulu-Natal	1 207	13	1 311	10
Eastern Cape	943	7	929	7
Boland	1 577	12	1 629	6
Western Cape	827	3	814	1
Kimberly & Northern Cape	28	0	43	0
Free State	345	7	362	6
SA	**9 184**	**74**	**10 231**	**60**

Source: FEMA

Construction worker dies in horrific accident (2007):

A 45 year old male worker was killed whilst driving a construction vehicle at Okahlamba District, Bergville. The worker seemed to have lost control of the vehicle whilst approaching a gravel road and was flung out of the cab, crushing his skull. His left leg and hand were also severed in the accident.

A document audit in terms of Occupational Health and Safety requirements has revealed that:

- No H&S plans were in place.
- No proof of H&S induction for the deceased was available.
- When the incident occurred there was no construction supervisor on site.
- The construction company had not conducted a risk assessment prior to commencing work.

Further investigations into the matter continues.

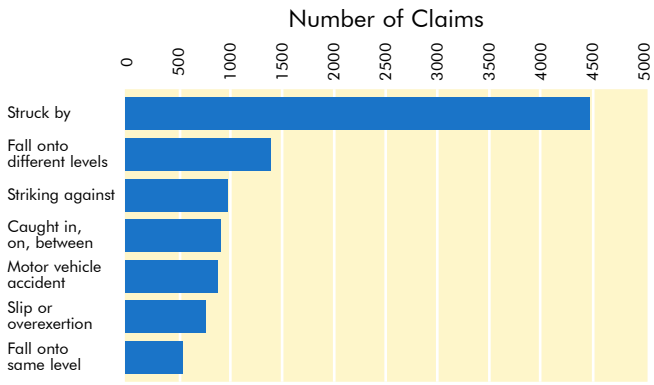
Source: Department of Labour
http://www.labour.gov.za

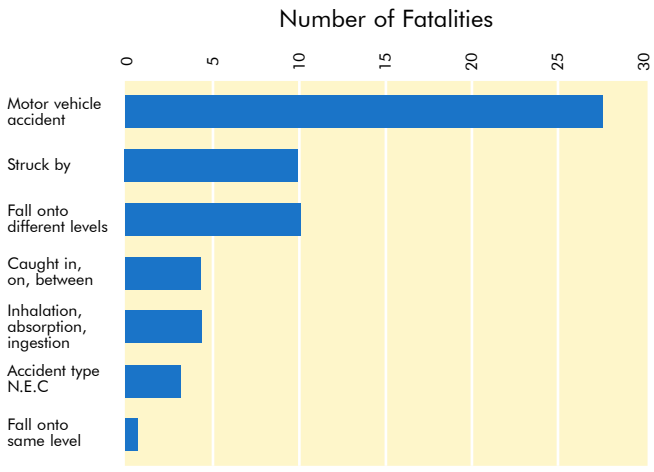
A more detailed analysis of the FEMA statistics shows that:

- the dominating causes of injuries were struck by (44%), falls on to different levels (14%) and striking against (10%);
- the dominating causes of fatalities were motor-vehicle accidents (MVAs) (47%), struck by (17%) and falls on to different levels (17%);
- penetrating wounds (30%) and superficial wounds (31%) predominated in terms of the nature of injuries sustained;
- multiple injuries caused 47% of fatalities;
- injuries to hands (24%), head and neck (19%), and legs (16%) were common anatomic regions involved; and
- in terms of agency, automobiles (10%) and hand tools (6%) dominated as causes of injuries.

H&S Accidents by Cause: FEMA

Description	2006		2007	
	Number of Claims	Number of Fatalities	Number of Claims	Number of Fatalities
Accident type N.E.C	43	1	95	3
Striking against	788	1	975	0
Struck by	4 031	17	4 474	10
Caught in, on, between	872	4	877	4
Fall onto same level	200	0	516	1
Fall onto different levels	1 254	18	1 406	10
Slip or over-exertion	1 131	1	683	0
Contact with temperature extremes	89	1	92	0
Inhalation, absorption, ingestion	80	3	199	4
Contact with electrical current	14	1	36	0
Unclassified / Not sufficient data	31	0	21	0
Motor vehicle accident	651	27	857	28
SA	**9 184**	**74**	**10 231**	**60**





Construction worker dies after 9th floor plunge (2008):

The Labour Department is investigating the fatal injury of an Eastern Cape building construction worker who died after falling from a lift shaft in East London on Friday (April 25).

According to reports, Fernando Chevoto was busy pouring concrete for the form work at the 9th level of a hotel and apartment block site adjacent to the Regent Hotel on the city's beach front when he plunged to the ground. He died in the ambulance that was rushing him to hospital.

Labour inspectors immediately halted all construction work at the site, and ordered the erection of safety guard rails along open areas. But operations were later allowed after inspectors were satisfied that all open areas and lift shaft has been suitably barricaded.

The department is currently investigating whether the employer was fully compliant of Construction Regulations and whether general occupational health and safety procedures were followed at the time of the accident.

Source: Department of Labour
http://www.labour.gov.za

COMPARISON WITH OTHER INDUSTRIES

The Compensation Commissioner provides statistics relative to the four classes of injuries relative to twenty-three agencies: medical aid; temporary disablement; permanent disablement and fatalities. Furthermore, they provide the disabling injury incidence rate (DIIR) and the severity rate (SR). Both these are available disaggregated in terms of temporary disablement, permanent disablement, and fatal.

Accident frequency and severity rates are the two essential standards required for reviewing accident statistics.

These rates show on average:

- how often disabling injuries occur in any particular industry; the accident frequency rate; and
- the seriousness of the time loss involved; the accident severity rate.

The construction industry has the 3rd highest number of fatalities per 100 000 workers.

The formulae for calculating frequency and severity rates enable the calculation of the rates used most often in all sectors of industry including the construction industry. The frequency rate is calculated by using the following formula:

$$\text{Disabling Injury Incidence Rate (DIIR)} = \frac{\text{Number of Disabling Injuries x 200 000}}{\text{Number of Hours Worked}}$$

The DIIR for construction was 4,89 in 1999, the ninth highest out of 23[3].

The severity rate is calculated by using the following formula:

$$\text{Severity Rate (SR)} = \frac{\text{Number of Workdays Lost x 200 000}}{\text{Number of Hours Worked}}$$

The severity rate indicates to management the seriousness of the disabling injury and the amount of time that will be lost by the worker for every 1 000 hours worked.

The SR for construction was 1,14 in 1999, the fifth highest out of 23[4].

It is notable that the Compensation Commissioner does not compute the fatality rate per 100 000 full-time equivalent workers, and neither the claims ratio, which is a function of expressing compensation claims paid as a percentage of compensation assessments paid.

The disablement per 100 000 workers for the Accident Fund (i.e. excluding FEMA) and excluding construction related motor-vehicle accidents for 1999 is shown below, from which it is seen that the construction industry has:

- the 3rd highest number of fatalities per 100 000 workers; and
- the 9th highest number of permanent disabilities per 100 000 workers.

Health and Safety Statistics: DoL Accident Fund (1999)

Industry	Temporary Disablement / 100 000	Permanent Disablement / 100 000	Fatalities / 100 000
Fishing	4 088	215	473,3
Transport	1 543	87	31,4
Building and Construction	981	96	25,5
Mining	1 746	269	23,5
Glass, Bricks and Tiles	1 298	154	14,9
Personal Services, Hotels	462	23	12,5
Agriculture and Forestry	772	61	12,2
Food, Drink and Tobacco	1 14	115	11,5
All Industries	808	72	11,4
Chemical	868	112	10,9
Iron and Steel	1 192	164	10,9
Diamonds, Asbestos, Bitumen	356	108	10,8
Local Authorities	1 096	46	9,6
Trade and Commerce	494	34	6,4
Wood	1 865	190	6,1
Educational Services	448	14	5,6
Leather	595	29	2,9
Entertainment and Sport	381	31	2,8
Professional Services, N.O.S.	158	17	1,9
Banking, Finance, Insurance	114	6	1,7
Printing and Paper	907	83	1,6
Charitable, Religious, Political and Trade Organizations	430	18	1,3
Medical Services	268	14	0,8
Textiles	606	38	0,5

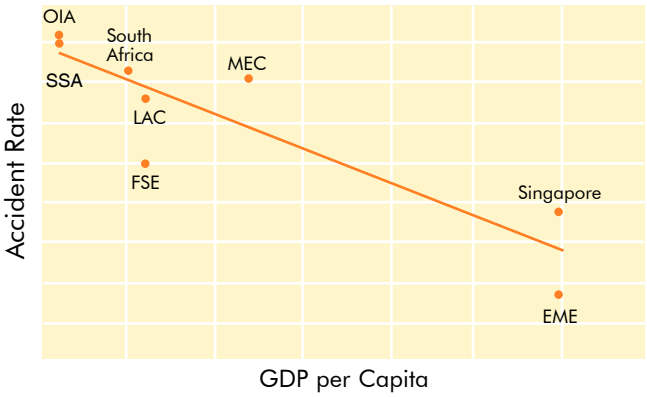
INTERNATIONAL COMPARISON

The disparity in occupational accident rates between different regions in the world is remarkable[5] as shown below. Both the fatality rates and the accident rates in Other Asia and Islands (21,5 and 16 434 per 100 000 workers respectively) and Sub-Saharan Africa (21 and 16 012 per 100 000 workers respectively), which consist mainly of developing countries, are much higher than that of Established Market Economies (4,2 and 3 240 per 100 000 workers), which consists of developed countries. South Africa had a fatality rate of 19,2 per 100 000 workers and an accident rate of 14 626 per 100 000 workers. It is notable that South Africa's fatality rate is marginally below that of Other Asia and Islands, and Sub-Saharan Africa.

Source: Anonymous

Occupational Accidents by Regions

Region	Fatality rate (per 100 000 workers)	Accident rate (per 100 000 workers)
Established Market Economies: EME	4,2	3 240
Former Socialistic Economies: FSE	12,9	9 864
Other Asia and Islands (excluding China and India): OAI	21,5	16 434
Sub-Saharan Africa (including South Africa): SSA	21,0	16 012
Latin America and the Caribbean: LAC	17,2	13 192
Middle Eastern Crescent: MEC	18,6	14 218
Singapore	9,8	7 452
South Africa	19,2	14 626



After: Hamalainen et al., 2006

H&S in the construction industry in South Africa lags significantly behind that in developed countries.

An approximate comparison between accident rates and GDP per capita is included above from which it is seen that there is a strong correlation between the accident (and fatality rates) and level of development (or GDP per capita). This must however not be seen as a level of complacency, but that there is significant scope for improvement in comparison with developed countries.

Five killed in Stellenbosch building collapse (2008):

A fifth construction worker has died of injuries he sustained when a Stellenbosch building collapsed during renovation work on Monday afternoon, said the department of labour. Four others were seriously injured in the 2pm collapse, which was triggered when a wall toppled, said spokeswoman Zolisa Sigabi. Stellenbosch municipal fire brigade chief of operations Tasso Steyn said the two-storey building, located in an industrial park in Onder-Papegaaiberg, used to be a KWV wine cellar, but was being remodelled to form an industrial hive.

Source: The Voice of the Cape, SAPA
Photograph: Leanne Stander, Die Burger

COMPLIANCE AND NON-COMPLIANCE

The state of construction H&S is illustrated further in the statistics for blitzes conducted by the Department of Labour (DoL) Inspectorate across the country in August 2007, during which 1 415 construction sites were visited. From the reported findings given below it is evident that 52,5% of the construction employers were non-compliant with the Occupational Health and Safety Act (OH&S Act) and the Construction Regulations. The inspectors issued 1 388 notices, namely 86 (6%) improvement notices, 1 015 (73%) contravention notices, and 287 (21%) prohibition notices.

52,5% of the construction employers were non-compliant with H&S legislation.

National Construction Blitz Inspection Report: August 2007

	Total Work Places Inspected	Number complying	Number complying	Improvements	Contraventions	Prohibition
Eastern Cape	136	24	102	0	106	14
Free State	155	271	84	2	77	5
Gauteng: North	57	21	35	8	40	2
Gauteng: South	247	80	167	25	172	163
KwaZulu-Natal	240	126	100	7	100	3
Limpopo	75	7	68	5	57	12
Mpumalanga	237	152	85	9	50	48
North West	56	22	32	5	27	23
Northern Cape	105	19	86	9	71	13
Western Cape	107	37	70	16	315	4
Total	1 415	759	829	86	1 015	287
%	100	47,5%	52,5%	6%	73%	21%

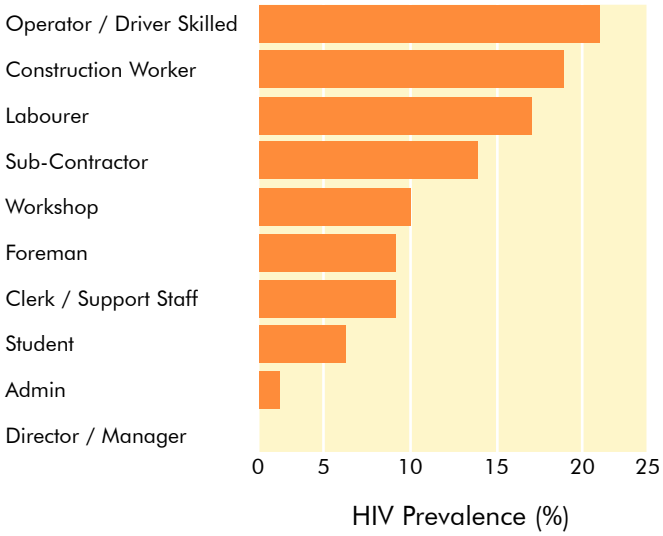
Source: Department of Labour, 2007

PRIMARY HEALTH AND HIV AND AIDS

Historically, the emphasis in South African construction has been on safety, and then to a substantially lesser extent on health. More recently, the need to reduce work related illnesses, ergonomics, and to a lesser extent primary health have also begun to receive attention by some contractors. Factors such as increases in insurance premiums, direct costs associated with hospitalisation and disability pay are also changing the focus of H&S towards the more non-traditional health, safety, ergonomics, and primary health method of management.

HIV and Aids is of particular significance in the construction industry - and construction currently has the third highest prevalence of HIV positive workers[6,7]. The industry faces increasing lost workdays due to absenteeism and productivity decreases rapidly as HIV infections develop into full-blown Aids and opportunistic infections start to take hold, together with skills shortages, and increased costs of construction due to rising overheads.

The results of HIV tests conducted on 10 243 construction employees drawn from 55 companies nationwide show that 14% were HIV positive, 84% were HIV negative, and 2% constituted missing data. The HIV prevalence rate is the highest among those aged 30 to 39 years (23%), followed by those in the 40 to 49 years grouping (18%). Persons under the age 20 years old had the lowest HIV prevalence rate[8]. In terms of occupation, the HIV prevalence is the highest amongst operators/drivers (21%), followed by skilled construction workers (19%), labourers (17%) and foremen (9%). The high HIV prevalence rate amongst operators/drivers, skilled construction workers and foreman will contribute to the loss of skills in the construction industry.



Source: Bowen et al., 2008

ECONOMICS OF CONSTRUCTION HEALTH AND SAFETY

The Cost of Accidents (CoA) can be categorised as being either direct or indirect, which collectively constitute the total CoA. Although the CoA is a trailing/outcome measure, it is the financial measure that can readily be related to by all stakeholders as it can be expressed as a percentage of organisation business volume or value of construction completed nationally. However, the minority of contractors in fact calculate the direct and indirect CoA.

• Direct costs tend to be those associated with the treatment of the injury and any unique compensation offered to workers as a consequence of being injured and are covered by workmen's compensation insurance premiums.

• Indirect costs, which are borne by contractors, include reduced productivity for both the returned worker(s) and the crew or workforce; clean-up costs; replacement costs; stand-by costs; cost of overtime; administrative costs; replacement worker orientation; costs resulting from delays; supervision costs; costs related to rescheduling; transportation, and wages paid while the injured is idle[9].

A breakdown of direct and indirect costs is given below:

Direct Costs	Indirect Costs
• Wages: 84% • Medical expenses: 16%	• pain and suffering: 58% • incident investigations: 12,6 to 17,3% • production loss and process delays: 8,4% • overtime: 9,1% • consumables, legal fees, funeral and compensation due to fatalities: 20%
• Contribution to CoA: 27%	• Contribution to CoA: 73%

After Pillay and Haupt, 2008

The direct costs of claims finalised, reported by the Federated Employers' Mutual Assurance Company (FEMA) amounted to about R116 million for 2007, implying indirect costs of around R1,65 billion. Similar figures from the Compensation Commission are not available, but it can be estimated that the total direct and indirect CoA in South Africa amounts to about R3,5 billion per year or around 2% of construction spend (GFCF).

The CoA, and the contribution of the direct and indirect costs, varies significantly in the literature, but recent research conducted in the United Kingdom (UK) by the Health & Safety Executive (HSE) determined indirect costs to be 11 times the direct costs[12]. Research conducted in South Africa determined the indirect costs to be 14,2 times the direct costs[13].

Research conducted in the USA indicates the total CoA to constitute *inter alia*, 6,5% of the value of completed construction[14], and UK approximately 8,5% of tender price[15]. Research in South Africa estimated the total CoA to around 5% of the value of completed construction[16].

Notwithstanding the uncertainty in quantifying the CoA, it must be recognised that ultimately it is the clients that incur the CoA as the CoA is included in contractors' cost structures.

In addition to the CoA, there is also a cost of implementing H&S systems within a company which it is estimated to cost between 0,5% and 3% of total project costs[17]. This confirms the international literature which indicates that the total CoA exceeds the cost of H&S. H&S must, however, be seen as an enabler and as the catalyst for enhanced performance relative to cost, the environment, productivity, quality, and schedule.

Ultimately, the CoA is transferred as a cost to the client which is estimated to be around 5% of the value of construction.

While Occupational Health and Safety in South Africa has steadily improved compared with statistics from ten years ago, we still need to police this issue to reach world standards.

Gavin Roberts, President MBSA 2007

SYNERGY

A study conducted among construction project managers investigated, *inter alia*, the extent to which inadequate or the lack of H&S negatively affects other project parameters[18]. The table below indicates that with the exception of schedule, identified by more than half of the respondents, all the parameters were identified by the majority of respondents. It is notable that productivity and quality predominate, both also having a cost implication, cost itself being ranked third.

The extent to which inadequate or the lack of H&S negatively affects other project parameters are shown below[19]:

Parameter	Response (%)	Rank
Productivity	87,2	1
Quality	80,8	2
Cost	72,3	3
Client perception	68,1	4
Environment	66,0	5
Schedule	57,4	6

Source: Smallwood, 1996

THE BUSINESS CASE FOR H&S

International literature indicates that the total CoA exceeds the cost of H&S and therefore, H&S is in essence a profit centre. Furthermore, the business case for H&S is enhanced by the fact that H&S is the catalyst for enhanced performance relative to cost, the environment, productivity, quality, and schedule.

SUMMARY

- An understanding of construction H&S is hampered by a lack of available statistics, and in particular that from the Compensation Commissioner.
- Statistics for 1999 showed that the construction industry accounts for around the third highest number of fatalities per 100 000 workers, and the ninth highest number of permanent disabilities per 100 000 workers.
- The fatality rate in the construction industry is around 20 per 100 000 workers, or around 150 fatalities per year excluding construction related motor-vehicle accidents.
- Motor-vehicle accidents account for around another 100 fatalities per year.
- There is a high rate of non-compliance with the requirements of the Construction Regulations with around 50% of construction sites found to be non-compliant in the August 2007 'blitzes'.
- H&S in the construction industry in South Africa lags significantly behind that in developed countries.
- The construction industry currently has the third highest prevalence of HIV positive workers, and the industry faces increasing lost workdays due to absenteeism and productivity decreases, together with skills shortages, and increased costs of construction due to rising overheads.
- The CoA is estimated to be around 5% of the value of construction costs which ultimately is passed onto clients.
- Inadequate or the lack of H&S negatively affects other project parameters i.e. productivity, quality and cost.
- The total CoA exceeds the cost of H&S, and therefore, H&S is in essence a profit centre.

LEGISLATIVE FRAMEWORK AND INSTITUTIONAL STRUCTURES

The poor H&S performance record of the construction industry around the world has resulted in H&S regulations being subjected to major revisions during the last three decades.

The primary objective of any H&S legislation is the prevention of accidents with their consequences in terms of injury, disablement and fatality, and ill health within the work environment. The achievement of this objective depends on good legislation supported by effective, sensible and accountable enforcement.

The introduction of H&S legislation in member states of the European Community was accompanied by enforcement of the legislation, which highlighted high levels of non-compliance with more than half of the sites being shut down in Portugal.

Source: Anderson, 2007

SOUTH AFRICAN LEGISLATION AND THE CONSTRUCTION REGULATIONS

The primary Acts that impact on construction H&S in South Africa are the Occupational Health and Safety Act No. 85 of 1993 (OH&S Act) and the complementary Compensation for Occupational Injuries and Diseases Act No. 130 of 1993 (COID Act). The OH&S Act replaced the previous Machinery and Occupational Safety Act No. 6 of 1983, the Machinery and Occupational Safety Amendment Act No. 40 of 1989, the Machinery and Occupational Safety Amendment Act No. 97 of 1991 and the promulgation thereof reflected the increased emphasis on health.

A fundamental human right of every worker is to be able to return home at the end of each working day; alive and healthy in the same physical condition that he/she commenced that working day.

A range of regulations promulgated under the OH&S Act impact on construction H&S, in particular the Construction Regulations promulgated in July 2003.

Major distinguishing characteristics of the OH&S legislative framework in South Africa and particularly the Construction Regulations include:

- A departure from the traditionally prescriptive or 'deemed-to-comply' or 'command-and-control' approaches to a performance-based approach in terms of which no standards for compliance are set.

Prescriptive legislation	Performance legislation
describes the means and methods of complying with the regulations by the contractor	describes what has to be achieved to comply with the regulations and leaves the means and methods of complying up to the contractor

Coega's bridge of death (2003):

Two construction workers died and 20 were seriously injured when scaffolding at a Coega bridge construction site dramatically collapsed yesterday. The bridge is being built across a railway line on the Coega IDZ site. There were 48 construction workers on top of the scaffolding when it collapsed and everything, including the workers, crashed to the ground. Six metro ambulances, five rescue units and four ambulances from Netcare were dispatched to the scene after the 5.45pm accident. Twenty of the injured were transported to various hospitals in Port Elizabeth.

Another 28 were treated for minor injuries at the scene. In a previous incident a week ago a crane operator working at the Port of Nqura harbour construction site was killed when a bucket containing several tons of concrete broke from the crane, crushing him to death.

Source: Helga Van Staaden and Sam Mkokeli, The Herald

- The redistribution of responsibility for construction H&S away from the contractor, who was previously solely responsible, to include all participants in the construction process from the client through to the final end-user.
- The compelling of H&S management as an obligation into the planning and design of virtually all construction projects.
- Emphasis on the identification of construction hazards and the assessment of risks to eliminate, avoid or, at the very least, reduce perceived risks.
- Consideration of H&S issues not just during the construction life of the project, but from project inception through to the final demise of the facility by demolition, including the operation, utilisation and maintenance periods.

- The introduction of a new participant to the construction process, the client-appointed H&S agent, tasked on behalf of the client to coordinate the other participants and documents to facilitate better management of H&S on construction projects.
- Mandatory H&S specifications and plans as instruments facilitating exchange and communication of H&S issues between all participants in the construction process, on all projects.
- Mandatory compilation of an H&S file by the principal contractor to be handed over to the client upon completion of the facility.

The Construction Regulations acknowledge the roles of each participant in construction. For example, whereas designers were not previously required to consider H&S issues, they are now required to avoid foreseeable risks as a duty for all construction projects.

IMPACT OF THE CONSTRUCTION REGULATIONS

Generally, the Construction Regulations are perceived to have had an impact. The manifestations of the impact are wide spread (which was the intention of the Construction Regulations), and in particular increased H&S awareness and increased consideration for, or reference to, H&S by project managers and general contractors[20]. However, research results indicate that there has not been an increase in consideration for or reference to H&S by designers and quantity surveyors and only a marginal increase by subcontractors[21].

The Construction Regulations are perceived to have had a wide spread impact, and in particular increased H&S awareness and increased consideration by project managers, and general contractors.

Although it cannot be quantified, it can be inferred that the Construction Regulations have had a positive impact on reducing H&S accidents.

Furthermore, a study conducted among member practices of the Association of Construction Project Managers (ACPM), Association of South African Quantity Surveyors (ASAQS), Consulting Engineers South Africa (CESA), the South African Institute of Architects (SAIA) and a group of 'better practice H&S' general contractors, indicates the importance of the five primary project parameters to the respondents' organisations. It is significant that the traditional project parameters (time, cost and quality) are ranked in the first three and construction H&S as fourth or fifth most important.

Of interest is to note the degree of importance of project H&S attributed to the various organisations viewed from the project life cycle where engineers, contractors and project managers assigning higher importance to H&S than the 'upstream' contributions of architects and quantity surveyors.

Degree of Importance of Various Project Parameters to Respondents' Organisations

Parameter	ACPM		ASAQS		SAACE		SAIA		Contractors		Mean	
	Mean score	Rank	Mean score	Rank	Mean score	Rank	Mean score	Rank	Mean score	Rank	Mean score	Rank
Project cost	4,63	2	4,74	1	4,42	2	4,39	2	4,89	1=	4,61	1
Project quality	4,37	3	4,15	3	4,64	1	4,64	1	4,78	3	4,52	2
Project time	4,68	1	4,41	2	4,29	3	4,25	3	4,89	1=	4,50	3
Project H&S	3,95	4	3,65	4	3,97	4	3,43	5	3,33	4	3,87	4
Environment	3,42	5	3,32	5	3,76	5	4,01	4	3,56	5	3,61	5

Source: Smallwood and Haupt, 2006

It is therefore generally perceived that the Construction Regulations have had a desired 'upstream', 'midstream', and 'downstream' impact. Notwithstanding this, the Construction Regulations are currently being extensively reviewed as part of the ongoing effort to improve the H&S performance of the industry.

Degree of Importance of Project H&S

Organisation	Mean Score	Rank
SAIA	3,43	5
ASAQS	3,65	4
SAACE (CESA)	3,97	2
ACPM	3,95	3
Contractors	4,33	1

cidb STANDARD FOR UNIFORMITY

The Construction Regulations place the responsibility for construction H&S on all participants in the construction process - including clients. In addition to good corporate governance issues, the client therefore has a legal obligation to address H&S in the procurement process, which is reflected in (amongst others) the selection and appointment of the project participants and contract documentation.

Notwithstanding this legal responsibility, clients are in a unique position to drive H&S performance improvement or the behaviour of project participants (including contractors) by prequalifying and/or selection of contractors based on H&S practices.

The cidb Standard for Uniformity in Construction Procurement (SFU) establishes minimum requirements for uniformity in construction procurement and is based on Construction Procurement Best Practices published by the Board. Compliance with this standard is mandatory for organs of state who solicit tender offers in the construction industry.

The SFU defines 'quality (functionality)' as "the totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs". 'Quality' is equated to 'functionality' in the SFU because of the preference to use 'functionality' in the Preferential Procurement Policy Framework Act No. 5 of 2000 (PPPFMA), whereas reference to 'quality' is more common internationally.

Construction H&S is clearly a 'stated or implied need' of the client and should therefore be used as criteria in selection and appointment of the project participants.

cidb Best Practice Guideline #A4, Evaluating Quality in Tender Submissions (1004) provides further guidance on quality criteria, namely:

a) technical merit;

b) response to (ability to relate to) the proposed scope of work/project design;

c) aesthetic and functional characteristics;

d) safety and environmental characteristics;

e) quality control practices and procedures which ensure compliance with stated employer's requirements;

f) reliability;

g) durability;

h) organisation, logistics and support resources relevant to the scope of work;

i) qualifications and demonstrated experience of the key staff (assigned personnel) in relation to the scope of work;

j) demonstrated experience of tendering entity with respect to specific aspects of the project/comparable projects;

k) running costs;

l) after-sales service and technical assistance;

m) delivery date; and

n) delivery period or period of completion.

The SFU and the Best Practice Guideline #A4 therefore provides for (and in some cases encourages) pre-qualification and selection of contractors based on, for example, construction H&S practices and procedures.

However, the SFU and the Best Practice Guideline #A4 make very little explicit reference to H&S - which should be addressed.

GENERIC LEGISLATION

A range of other legislation impacts on the construction industry; some of which have direct or indirect reference to H&S, while others should include a reference to H&S:

i) Basic Conditions of Employment Act No. 75 of 1997 as amended by the Basic Conditions of Employment Amendment Act No. 11 of 2002: The intent of the Act is "to give effect to the right to fair labour practices" as referred to in the Constitution and the International Labour Organization. The Act makes several references to the H&S of (construction) workers. For example:

- the regulation of working time "must be made with due regard to H&S of employees" (Clause 7a-7c);
- in terms of Clauses 13.1 and 13.3 the maximum permitted hours of work may be prescribed by the Minister of Labour on grounds of H&S; and
- Clauses 17.3 (a-c) require employers to inform employees of any H&S hazards and enable them to undergo medical examinations concerning those hazards at the employers' account.

ii) Labour Relations Act No. 66 of 1995 as amended: The Act recognises the right of every worker to fair labour practices as advocated in Section 14 of the Constitution and Participation in Decision-making in the Workplace. By implication, the effect of these provisions requires employers to provide working environments and conditions that do not threaten the H&S of their workers which, if they did, would constitute an unfair labour practice. Employers are required to inform their workers of anything that might affect their working conditions, which by implication would include their H&S. The Act also allows for the promotion and establishment of training and education schemes, which again by implication would include H&S training and education. Where workplace forums have been established they are entitled to be consulted by employers about, *inter alia*, restructuring of the workplace including the introduction of new technology and new work methods, changes in the organisation of work, and education and training. Therefore, while the Act is silent with respect to be explicit or express reference to H&S it is implied that H&S be considered as part of the creation and sustaining of harmonious working relationships between employers and workers.

iii) National Building Regulations and Standards Act No. 103 of 1977: The National Building Regulations and Building Standards Act No.103 of 1977 address a range of H&S issues relative to both the public and workforce. Part E 'Demolition work', addresses inter alia, safety during demolition, safeguarding of basements and prohibition of dangerous methods. Part F 'Site Operations' addresses a range of H&S issues, *inter alia*, protection of the public, control of dust and noise, unstable soil conditions, builders' sheds, sanitary facilities, waste material on site and cleaning of site. Part G 'Excavations' addresses *inter alia*, general stability requirement, and Part H 'Foundations', *inter alia*, unstable founding conditions[22].

STANDARD FORMS (CONDITIONS) OF CONTRACT

The cidb Standard for Uniformity in Construction Procurement recommends the use of the following standard forms of contract for engineering and construction works' contracts:

- General Conditions of Contract (GCC) for Construction Works as published by the South African Institution of Civil Engineering;
- Conditions of Contract for Construction for Building and Engineering Works designed by the Employer ("Red Book")(1999), Conditions of Contract for Plant and Design-Build for Electrical and Mechanical Plant and for Building and Engineering Works, designed by the Contractor ("Yellow Book")(1999), Conditions of Contract for EPC/Turnkey Projects ("Silver Book")(1999) or Short Form of Contract ("Green Book")(1999) published by the International Federation of Consulting Engineers (FIDIC);
- JBCC series 2000 Principal Building Agreement or Minor Works Agreement published by the Joint Building Contracts Committee; or
- NEC3 Engineering and Construction Short Contract, NEC3 Engineering Construction Contract, NEC3 Professional Services Contract or NEC3 Term Services Contract published by the Institution of Civil Engineers.

All of these standard forms of contract make explicit or implicit reference to the fact that the forms of contract are subject to the laws of the land and therefore to South African legislation impacting on construction H&S. More specifically, however:

- the GCC does not make any explicit reference to H&S other than the requirement for "Reporting of Accidents";
- the JBCC does not make any explicit reference to H&S, but does make explicit reference to the parties complying with all laws, regulations and bylaws regarding the execution of the works; and

- the FIDIC and NEC conditions of contract (which are of overseas origin) do make specific reference to H&S, although in some cases the terminology or referencing does not fully align with the requirements of the South African H&S legislative framework.

Clearly, scope exists for the standard forms of contract to include more direct reference to construction H&S, the Construction Regulations and the obligations of contractors as well as providing for additional client driven H&S requirements.

REGULATORY ENFORCEMENT

The primary construction H&S regulatory and enforcement structures in South Africa are the OH&S Inspectorate within the DoL and the Mine H&S Inspectorate within the Department of Minerals and Energy (DME). Compliance with building regulations falls within the ambit of local authorities and the cidb's Act also provides for the cidb to play a regulatory and/or promotional role.

A number of notable accident reports have to date not been published by the DoL:

- Pretoria North slab collapse, 1996;
- Investec scaffold collapse, 1997;
- Kokstad prison crane accident, 1999;
- Bridge collapse, N1 highway, Pretoria bypass, 2002;
- Northpark Centre structure collapse, Pretoria, 2002;
- Randburg Mall scaffold collapse, Johannesburg, 2002;
- Coega, Port Elizabeth, bridge support-work colapse, 2003; and
- Woodmead, Johannesburg, ready-mix concrete truck accident, 2007.

a) OH&S Inspectorate: The OH&S Inspectorate is responsible for the enforcement of the Occupational Health and Safety Act (OH&S Act) and is positioned within the DoL. Currently, the DoL Inspectorate's influence is primarily downstream (i.e. on the construction site) and their role is reactive as opposed to proactive (i.e. promotional).

Stakeholder comments regarding the effectiveness of the DoL OH&S Inspectorate:

OH&S Consultants:

- Under-staffed, very little skills, untrained, little authority, and little knowledge.
- The Regional office has become totally ineffective due to all the expertise having left.
- More reactive than proactive.
- Skills, knowledge and competency non-existent.

Designers:

- DoL have no idea of what dangers can be encountered on a construction site. They do not identify a real danger staring them in the face.
- Inspectorate is non-existent.
- Hopelessly understaffed and not enough resources.
- They don't contact us, neither do we.

Source: Geminiani and Smallwood, 2006

According to a recent study investigating the effectiveness of the DoL Inspectorate[23], the Inspectorate was perceived to be more ineffective than effective. In this study the Inspectorate was perceived to:

- make use of marginally appropriate checklists;
- be lacking in competencies;
- visit sites infrequently;
- visit a small percentage of sites;
- be poor in terms of liaison and promotion;
- be poor in terms of morale, motivation and job satisfaction;
- be ineffective in terms of enforcing legislation;
- not contributing to an improvement in H&S;
- be ineffective in terms of assuring H&S;
- be insignificant in terms of accident prevention; and
- ineffective in terms of conducting its duties.

Key recommendations of this study include:

Organisational:

- The DoL inspectors need to be competent in construction related matters, by possessing adequate knowledge, skills, experience, appropriate qualifications and adequate assessment capabilities.
- The DoL Inspectors need to be knowledgeable and competent in terms of addressing issues during inspections.
- The DoL Inspectorate needs to address the severe staff shortage problem by appointing additional competent inspectors nationwide.

But while such "raids", usually by an understaffed labour department inspectorate, sometimes result in media coverage, they barely scratch the surface of the problem. "It's really just a public relations exercise; mostly form and little substance," admits a labour department official.

Source: Terry Ball, Business Report, 13 April 2007

Inspections:

- The DoL Inspectorate needs to increase the number of 'blitz' inspections to construction sites, manufacturing premises and suppliers on a more regular basis.
- The number of 'blitz' inspections need to be conducted more frequently on a 'surprise' basis

• The DoL Inspectorate needs to establish the formation of an accreditation system relative to construction OH&S.

• The DoL Inspectorate needs to establish the formation of an incentive scheme for construction

Other:

- The DoL Inspectorate needs to establish the formation of an accreditation system relative to construction OH&S[24].
- The DoL Inspectorate needs to establish the formation of an incentive scheme relative to construction OH&S[25].
- There needs to be an OH&S policy review by the DoL Inspectorate.
- Recent OH&S statistics need to be available and be kept on record for statistical purposes. These updated OH&S statistics must be available for all stakeholders to observe.

b) Compensation Commissioner: The Compensation Commissioner (CC) which is also positioned within the DoL is responsible for the implementation of the Compensation for Occupational Injuries and Diseases Act No. 130 of 1993 (COID Act), which regulates all aspects of workers' compensation insurance. The main objective of this Act is "to provide for compensation for disablement caused by occupational injuries or diseases sustained or contracted by workers in the course of employment, or for death resulting from such injuries or diseases[26]." The Act requires employers to report occupational injuries within seven days of such injuries being reported and occupational diseases within fourteen days of diagnosis[27].

The Compensation Fund has often been criticised for poor performance in terms of payment of claims. More recently, an article *Patients in dire straits Compensation Fund obsolete?* states: "..., it is evident that the fund is completely dysfunctional"[28]. Furthermore, the Compensation Fund has also frequently been criticised for the lack H&S statistics; the most recent available being for 1999.

d) Department of Minerals and Energy: The Mine Health and Safety Act No. 29 of 1996 was promulgated to provide for the protection of the H&S of employees and other persons at mines. Although the Mine H&S Inspectorate is responsible for the enforcement of the Mine Health and Safety Act, construction and related contractors undertake extensive work on the mines and are thus subject to both this Act and the OH&S Act.

e) Local Authorities: Many local authorities around the world have a direct impact on construction H&S, quality, etc. For example, the City of Melbourne, Australia, requires careful management of excavation, demolition and building work within its municipal boundaries[29]. To achieve this, the city requires many builders and developers to prepare a Construction Management Plan (CMP) that takes into account all relevant aspects of demolition or building work. The need for CMPs depends on the nature of work, likelihood of disruptions, impact on local amenity, dangers or risks involved, traffic management or any other relevant issue required to be addressed under the Planning Permit. A CMP must be submitted to fully address each new stage of construction. The elements which must be included in a CMP are: public safety, amenity and site security; operating hours, noise and vibration controls; air and dust management; storm-water and sediment control; waste and materials re-use and traffic management. It must also consider broader obligations including recycling, waste management and environmental initiatives.

The definition of designer in terms of the Construction Regulations includes "persons that check and approve a design" which implicitly includes local authorities and which are ideally positioned to conduct reviews of the general design, detailed design, details and specification in terms of identifying resultant exposure to hazardous materials and hazardous processes. Furthermore, local authorities could request that H&S specifications be submitted, which would enable them to determine whether the requirement of clients to provide such a specification has been adhered to, whether designers have provided design and construction method statements where required to do so, and whether H&S information has been provided or not. However, available evidence suggests that South African local authorities do not contribute to construction H&S.

SUMMARY

- The Construction Regulations have redistributed the responsibility for construction H&S to all participants in the construction process, from the client through to the final end-user.
- The South African OH&S legislative framework, particularly the Construction Regulations, is largely performance based and compare favourably with the OH&S legislation of UK, Europe and New Zeeland. It is unlike the Occupational Safety and Health Act (OSHA) in the USA, which is in the main prescriptive in nature and therefore retaining the contractor's responsibility for H&S.
- The Construction Regulations are perceived to have had an impact, in particular amongst project managers and contractors.
- Although it cannot be quantified, it can be inferred that the Construction Regulations have had a positive impact on reducing H&S accidents.
- *The cidb Standard for Uniformity in Construction Procurement,* which establishes minimum requirements for uniformity in construction procurement and is mandatory for organs of state, does not make adequate explicit reference to construction H&S in procurement.
- The GCC and JBCC do not make any direct reference to construction H&S, the Construction Regulations or the obligations of contractors nor providing for additional client driven H&S requirements.
- A recent study concluded that the DoL Inspectorate was perceived to be more ineffective than effective.
- The DoL Inspectorate's influence is primarily downstream (i.e. on the construction site) and their role is reactive as opposed to proactive (i.e. promotional).
- Studies have shown that the Compensation Commissioner is perceived to be dysfunctional; often been criticised for poor performance in terms of payment of claims and for the lack of availability of construction H&S statistics.
- Local authorities should be ideally positioned to impact on H&S, but evidence suggests that South African local authorities do not contribute to construction H&S.

DYNAMICS OF CONSTRUCTION HEALTH AND SAFETY

Construction H&S is impacted on by various participants across the life cycle of a construction project. Decisions made at one stage in the life cycle also affect H&S at another stage further down in the life cycle, and key responsibilities at the various stages are to appoint participants that have the necessary competence and capacity in construction H&S relevant to the project risks. Furthermore, construction H&S performance is influenced by the H&S specification and communication of H&S expectations and requirements from one participant to the others, and importantly on the effective monitoring of compliance with these expectations.

CLIENTS

The Health and Safety Executive (HSE)[30] in the UK contends that clients have a pivotal role in setting and achieving high standards in H&S as they:

- set the tone for projects;
- have overall control of contracts and how projects are undertaken;
- make key decisions such as those related to budget and time; and
- select the designers and contractors.

Furthermore, experience indicates that high H&S standards are achieved on projects where clients are committed to H&S and provide appropriate management oversight. However, the HSE[31] notes that the challenge is to educate and motivate clients regarding the importance of their role and the benefits of well-managed, healthy and safe projects which will require clear evidence of the costs and benefits.

In line with these international trends, the Construction Regulations in South Africa have redistributed the responsibility for construction H&S away from the contractor, who was previously solely responsible, to include all participants in the construction process from the client through to the final end-user.

Section 4 of the Construction Regulations (2003) requires that:

(1) A client shall be responsible for the following in order to ensure compliance with the provisions of the Act:

(a) to prepare a documented health and safety specification for the construction work …;

(d) to take reasonable steps to ensure that each principal contractor's health and safety plan … is implemented and maintained on the construction site;

(e) to stop any contractor from executing construction work which is not in accordance with the principal contractor's health and safety plan …;

(2) A client shall discuss and negotiate with the principal contractor the contents of the health and safety plan … and thereafter finally approve the health and safety plan for implementation.

(4) No client shall appoint a principal contractor to perform construction work, unless the client is reasonably satisfied that the principal contractor that he or she intends to appoint has the necessary competencies and resources to carry out the work safely.

The important role of the client in influencing construction H&S is highlighted in a study conducted in South Africa among Shell's contractors, designers and project managers. This study determined that Shell's H&S requirements not only contributed to an improvement in H&S on Shell's projects, but also on the contractors' projects in general and that Shell has influenced their contractors' H&S performance[32]. Furthermore, the consultants' indication that Shell's requirements had influenced their degree of consideration for H&S reinforces the contention that clients can influence construction H&S and highlights the indirect influence that clients can realise relative to construction H&S.

The findings and conclusions emanating from the above study indicate the ongoing need for Shell to promote the integration of design and construction, realise collective constructability reviews, pre-qualify designers and contractors on quality, implement the requirement that designers and contractors implement QMSs and EMSs and evolve project quality plans. Other recommendations include that Shell ensure that project durations are compatible with the nature and scope of the work; that procurement systems, procedures and practices always complement H&S; and that contract documentation facilitates financial provision for H&S[33].

The extent to which clients in fact influence construction H&S varies. A study conducted among members of the South African Property Owners Association (SAPOA) (undertaken some two years subsequent to the promulgation of the Construction Regulations) determined that these clients do undertake a range of H&S interventions and institute a range of H&S requirements relative to contractors. The study also indicated that in addition to already having influenced contractor H&S[34], they could influence it more, specifically through pre-qualification of contractors on construction H&S.

Pre-qualification of contractors by clients on H&S could contribute to an improvement in construction H&S.

However, the extent of client influence is brought into question when it is noted that:

- the Construction Regulations requires that "a client shall be responsible to ensure that each principal contractor's health and safety plan … is implemened and maintained on the construction site" and "to stop any contractor from executing construction work which is not in accordance with the principal contractor's health and safety plan …"; while
- in the August 2007 'blitzes' 52.5% of sites were non-compliant.

The high level of non-compliance on construction sites (as illustrated by the August 'blitzes') suggests a lack of influence by some clients on construction H&S.

CLIENT APPOINTED HEALTH AND SAFETY AGENT

The Construction Regulations provide for the client appointing an agent to act as his/her representative in terms of the responsibilities imposed by the Regulations. This would include the following with respect to H&S:

- coordinating the design process;
- facilitating communication and cooperation between all stakeholders;
- notification to the DoL;
- coordination of work;
- gathering of pre-tender information;
- advise regarding the adequacy of the H&S plan;
- manage H&S through all phases; and
- facilitate the compilation of the H&S file.

Section 4 of the Construction Regulations (2003) requires that:

(5) A client may appoint an agent in writing to act as his or her representative and where such an appointment is made, the responsibilities as are imposed by these regulations upon a client, shall as far as reasonably practicable apply to the person so appointed.

(6) No client shall appoint any person as his agent, unless the client is reasonably satisfied that the person he or she intends to appoint has the necessary competencies and resources to perform the duties imposed on a client by these regulations.

The client-appointed H&S agent could therefore significantly impact on construction H&S, but evidence to date suggests that the influence of client-appointed H&S agents is very mixed, due to either:

- a lack of experience of the agent;
- a lack of resources; and/or
- an inability to influence the necessary outcomes.

Note that the Regulations do require that the agent "has the necessary competencies and resources to perform the duties imposed on a client by these regulations" but does not prescribe the competencies required.

PROJECT MANAGERS

Construction project management includes the management on behalf of a client of the entire process necessary for the procurement of the design and the construction of a project from project initiation through to project close-out. Project managers are in a unique position as they effectively integrate design and construction.

In many cases, the construction project manager is also appointed as the clients' agent for H&S agents in terms of Regulation 4(6).

Research undertaken among member practices of the Association of Construction Project Managers (ACPM) has shown that project managers influence H&S more frequently during construction than on procurement and design related issues[35]. Site meetings, site handover and site inspections or discussions were identified as the main occasions at which project managers influenced H&S during construction. Project managers influenced design to a lesser extent primarily through constructability reviews.

Notwithstanding this, there is a need and scope for project managers to further influence H&S and specifically:

- during the upstream phases of design, namely concept design, preparation of working drawings and design coordination meetings;
- through design reviews, including elevations, details, finishes and schedules, and various characteristics of materials;
- through integration of design and construction, realise an optimum client brief, finalise design before construction commences, discourage client changes, and
- through pre-qualification or selection of contractors on H&S and quality, including a specific mention of and a financial allowance for H&S in contract documentation, avoiding competitive tendering and realising the implementation of QMSs in design and construction.

Strengthening construction H&S could be achieved through:

- *pre-qualification or selection of contractors on H&S and quality;*
- *including a specific mention of and a financial allowance for H&S in contract documentation;*
- *avoiding competitive tendering; and*
- *implementation of QMSs in design and construction.*

DESIGNERS

Designers influence H&S directly through design specific, supervisory and administrative interventions and indirectly through the type of procurement system used, pre-qualification, project time, partnering and the facilitating of pre-planning[36].

Section 9 of the Construction Regulations (2003) requires that:

(2) The designer of a structure shall:

(b) inform the contractor in writing of any known or anticipated dangers or hazards relating to the construction work, and make available all relevant information required for the safe execution of the work upon being designed or when the design is subsequently altered;

(d) not include anything in the design of the structure necessitating the use of dangerous procedures or materials hazardous to the health and safety of persons, which could be avoided by modifying the design or by substituting materials;

(e) take into account the hazards relating to any subsequent maintenance of the relevant structure and should make provision in the design for that work to be performed to minimise the risk;

(i) ensure that when preparing the design, cognisance is taken of ergonomic design principles in order to minimise ergonomic related hazards in all phases of the life cycle of a structure.

Studies conducted among member practices of the Consulting Engineers South Africa (CESA) and the South African Institute of Architects (SAIA) concluded that while designers do influence H&S during design and construction, the attention is more prevalent during construction (through supervisory and administrative interventions) than during design and procurement[37;38].

Clearly, engineering designers can contribute more to H&S during design and procurement than they currently do[39] - specifically during the upstream phases of design, namely concept design, constructability reviews and design coordination meetings. Similarly, designers can influence H&S more through evaluating tenders, deliberating project duration and pre-qualifying or selecting contractors on H&S.

The potential contributions to construction H&S that designers can make, indicates a need for leadership, the provision of guidelines and tools, capacitation through tertiary education and legislative interventions.

The role of designers in construction H&S can be enhanced through:

- *leadership;*
- *guidelines and tools;*
- *capacitation; and*
- *legislative interventions.*

QUANTITY SURVEYORS

Section 4 of the Construction Regulations (2003) requires that:

(1) A client shall be responsible for the following in order to ensure compliance with the provisions of the Act:

(h) to ensure that potential principal contractors submitting tenders, have made provision for the cost of health and safety measures during the construction process.

Quantity surveyors can have a direct influence on construction H&S by, amongst others, drawing up specifications that ensure that principal contractors have made adequate allowance for H&S. However, studies[40] have shown that quantity surveyors are only marginally impacting on construction H&S, but that there is significant potential for quantity surveyors to do so - primarily by promoting bills of quantities that provide adequate allowance for H&S.

Bills of quantities should include itemised allowances for H&S.

CONTRACTORS

Contractor H&S performance is influenced by a number of (internal) factors, including:

- management commitment;
- communication and feedback;
- supervisory environment;
- supportive environment;
- H&S rules and procedures;
- training and competence level;
- worker's involvement and personal risk appreciation; and
- work pressure.

In addition, H&S performance is influenced by upstream factors and specifically monitoring of compliance by the client's agent.

While the H&S practices of many South African contractors are comparable with those in the rest of the world, the results of a comparative analysis of H&S practices between representative companies in Singapore (a developed country) and South Africa (a developing country) undertaken in 2007 identified significant difference in construction H&S performance between the two countries[41] with South African contractors showing poorer performance in many areas.

In an international comparison, South African contractors demonstrated lower management commitment, a weaker H&S supervisory environment, and lower H&S training and competence than their counterparts in Singapore.

Comparison of H&S Practices in Singapore and South Africa

Factor/Health and Safety Practice	Singapore Mean	South Africa Mean
Management Commitment		
The H&S of workers is important to the head office management	4,1	4,0
The head office management ensure compliance with H&S legislation and regulations	4,1	3,8
The head office management always address H&S issues	4,0	3,7
The head office management are intolerant of poor construction H&S	3,9	3,6
Workers are rewarded for good H&S	3,7	3,3
The firm penalises workers for poor H&S	3,9	3,1
The head office management insists on the elimination of hazards	3,8	3,7
Communication and Feedback		
We have regular H&S meetings	4,2	3,6
Workers are encouraged to report unsafe and unhealthy behaviour and working conditions	3,9	4,1
Results of H&S inspections are always discussed at H&S meetings	3,7	3,6
All workers are kept informed of the provisions of the H&S plan	3,6	3,4
Supervisory Environment		
The firm employs trained H&S staff on projects	4,2	3,4
We have trained H&S representatives on site	4,0	3,7
H&S inspections are done regularly and at least daily	4,0	3,2
There is a general lack of proper supervision	2,0	2,8
Supportive Environment		
Workers are responsible for the H&S of their fellow workers	3,9	3,8
Health and Safety Rules and Procedures		
We have a written H&S policy in place	3,9	4,0
Each project has a project-specific H&S plan	3,6	3,6
Training and Competence Level		
All workers undergo orientation/induction before they are allowed to start work on site	4,2	3,7
Construction accidents are caused by unsafe worker acts or behaviour	4,0	3,7
Workers are trained in the proper care and use of PPE	4,0	3,7
More H&S education and training is needed	3,7	4,1
Workers are regularly trained in H&S	3,7	3,2
Worker's Involvement and Personal Risk Appreciation		
Workers have the right to refuse to work in unsafe conditions	4,2	4,3
Workers are responsible for their own H&S	3,9	3,5
Most workers on site view health and safety as important	3,6	3,7
Workers are involved with H&S inspections	3,3	3,3
Workers are consulted when the H&S plan is compiled	3,2	2,9
Workers participated in the formulation of the H&S policy	3,0	3,0
Workers regularly report unsafe and unhealthy behaviour and working conditions	3,6	3,5
Work Pressure		
The firm is only concerned with getting the job done as quickly as possible	3,7	2,9
Workers often work shifts or overtime	3,6	3,8
Scale: 5 = strongly agree, 1 = strongly disagree		

Source: Teo et al., 2008

Specifically, the following lagged behind that of the Singapore construction companies benchmarked against and need to be strengthened to achieve an improvement in construction H&S practices in South Africa:

- management commitment;
- the H&S supervisory environment; and
- H&S training and competence.

In absolute terms, the following also ranked low in South Africa and also require attention:

- worker's involvement and personal risk appreciation; and
- work pressures.

Interestingly, the supportive environment and H&S rules and procedures received the highest rating among South African companies which, in part, can be attributed to the introduction of the Construction Regulations.

Typical Contractor Profiles

Grade	Maximum tender value (Rm)	Turnover (Rm)	Business Form	Presence	Average Age of Company	Average Number of Staff
9	Unlimited	>1000	PubC/MN	National/International	20	1 000
8	130	100 - 1000	PubC	National/Regional	12	100
7	40	20,0 - 100	PC/PubC/CC	Regional/National	10	30
6	13	10,0 - 100	PC/PubC/CC	Regional/National	10	15
5	6,5	2,0 - 30	PC/CC/SP	Largely regional	7	6
4	4	1,0 - 30	PC/CC/SP	Provincial/Local	7	4
3	2,0	0,5 - 10	CC/SP	Local	6	3
2	0,650	0,2 - 0,5	CC/SP	Local	6	3

Note: SP = Sole proprietorship; CC = Close corporation; PC = Private company; PubC = Public company; and MN = Multi-national

SMALL AND EMERGING CONTRACTORS

Anecdotal evidence indicates that the medium to large, and large contractors and subcontractors working on their projects tend to address H&S to a greater degree than small contractors, emerging contractors, as well as the majority of housing contractors. Some justification for this is given below.

a) H&S Training and Competence: Typically, the higher the cidb contractor grading, the more likely it is that members of top management will have studied at tertiary institutions in construction-related programs towards degrees in which, in most cases, at least some exposure has been obtained towards H&S. On the other hand, those in the lower grades are more likely to have limited formal education with some exposure, either formally or informally, to construction craft or trade training. In the absence of apprenticeships this training is probably in the form of the recently introduced learnerships.

The findings of a recent study[42] conducted in a major parastatal organisation and a cross-section of contractors working for them indicates that 60% of upper management and 67% of site managers had formal construction-related qualifications. In the latter case most had trade-related qualifications. Of top managers, 21% had qualifications at degree level while only 9% of site managers had qualifications at this level. Only 39% of other site workers had construction-related qualifications.

Extent of Construction Qualifications

Qualification	Sample	Top management	Site management	Other workers
None	45%	40%	33%	61%
Learnership	5%	0%	6%	10%
Trade	18%	14%	26%	8%
Diploma	22%	24%	26%	18%
Other	10%	21%	9%	3%

Source: Haupt and Smallwood, 2007

Source: Terrance Mtola

Turning specifically to H&S training, the recent study determined that 34% of top management had no H&S training of any kind. Similarly, 33% of site workers had received no H&S training.

Extent of H&S training

Percentage of Category Trained in H&S		
Top Management	Site Management	Other Workers
66%	82%	67%

Source: Haupt and Smallwood, 2007

b) Financial Resources for H&S: It is more likely that contractors registered in the upper cidb grades will have more financial resources to budget for and provide H&S education and training not only for their managers, but also larger numbers of their site workers. Despite there being no evidence in South Africa to suggest that contractors in the higher cidb grades necessarily have better H&S performance and culture than those at the other end of the scale, it is plausible to expect that smaller contractors, especially those in Grades 2 to 4, given their limited resources and capacity, would demonstrate poorer H&S practices and H&S culture.

c) H&S Systems, Rules and Procedures: Contractors in Grades 2 to 4 are less likely to have any formal H&S management systems in place. Typically, the management of H&S will largely be less structured and based rather on prior contract experience. It is also likely that these contractors would not be fully aware of the demands and requirements of the South African generic and construction H&S legislative framework.

d) H&S Risk Exposure: There are some H&S risk exposure factors that influence H&S outcomes relative to various contractor grades. Typically, higher grade contractors would be involved in projects with higher H&S risk such as construction at elevated heights. Lower grade contractors would normally be restricted to one or two-storey construction, in which the consequence of an incident would be lower.

Notwithstanding this, the risk exposure to other incidents is somewhat independent of contractor grades; such as motor-vehicle accidents, use of power tools, being struck by falling objects, etc.

H&S dynamics of lower cidb Grade contractors:

- *Lower grade contractors have limited resources to provide for H&S;*
- *H&S will largely be less structured and based rather on prior contract experience; and*
- *The risk exposure is the same or lower than the higher Grade contractors.*

	Lower Grade Contractor	Higher Grade Contractor
Capability		
H&S skills	Lower	Higher
Financial resources for H&S	Lower	Higher
H&S systems	Less structured	More formal
H&S Risk		
Elevated heights	Lower	Higher
Power tools	Same	Same
Transportation	Same	Same

The above confirms that in order to achieve an improvement in the South African industry, attention needs to be given to, among others, improvement in on-site supervision and education and training in H&S. Achieving improvements in these areas is challenging given the current skills deficit and expertise differential in the sector.

In the latter case, the differences are marked relative to management skills and experience between the formal developed and informal underdeveloped sectors and particularly SMMEs. A developmental approach is needed to support the small and emerging contractors.

SUBCONTRACTING

Section 5 of the Construction Regulations (2003) requires that:

(1) A principal contractor shall provide and demonstrate to the client a suitable and sufficiently documented health and safety plan, based on the client's documented health and safety specification …

(3) A principal contractor shall be responsible for the following in order to ensure compliance with the provisions of the Act:

(a) to provide any contractor, who is making a bid or appointed to perform construction work for the principal contractor, with the relevant sections of the documented health and safety specification …

(c) to take reasonable steps to ensure that each contractor's health and safety plan … is implemented and maintained on the construction site …

(d) to stop any contractor from executing construction work which is not in accordance with the principal contractor's and/or contractor's health and safety plan for the site or which poses a threat to the health and safety of persons;

(g) to ensure that potential contractors submitting tenders have made provision for the cost of health and safety measures during the construction process.

(4) A contractor shall provide and demonstrate to the principal contractor a suitable and sufficiently documented health and safety plan, …

(10) No principal contractor shall appoint a contractor to perform construction work unless the principal contractor is reasonably satisfied that the contractor he or she intends to appoint, has the necessary competencies and resources to perform the construction work safely.

(12) No contractor shall appoint another contractor to perform construction work unless he/she is reasonably satisfied that the contractor he/she intends to appoint has the necessary competencies and resources to perform the construction work safely.

(14) Every contractor shall as far as is reasonably practicable, promptly provide the principal contractor with any information which might affect the health and safety of any person at work carrying out construction work or any person who might be affected by the work of such a person at work or which might justify a review of the health and safety plan.

In terms of structure, the construction industry is a paradox. It is one of the largest industries, but the majority of its participants are small businesses. The members are highly specialised and layered with complex interlocking interests and traditions[43]. One such tradition is diverse and fragmented subcontracting. Subcontracting tends to shift both risk and responsibility from the main contractor to the subcontractors. It is also usual to have multi-layered or multi-level subcontracting whereby a subcontractor hires another subcontractor to undertake its work. In addition, there is the labour-only subcontracting practice where labour is loaned to the main contractor by agents.

The impact of subcontracting on H&S is complex. Research has shown that main contractors can positively influence the H&S practices of subcontractors, in fact, more than subcontractors themselves can[44]. Specifically, positive actions and commitment to H&S by a main contractor and the integration of these into all activities including those of subcontractors are key factors to strengthen H&S actions within subcontractors.

On the other hand, the H&S performance of subcontractors impacts heavily on the H&S performance of a main contractor. In the absence of effective subcontractor management the performance of the principal contractors is negatively affected.

The practice of subcontracting is responsible for the problem of casualisation of labour. Casualisation has reached endemic proportions in South Africa and is responsible for disproportionate H&S problems on sites as responsibility lines are not very clear. Casual labour is taken as the responsibility of the agent and not the main contractor and therefore may not be provided with H&S protection by the main contractors.

SUMMARY

- Clients have a pivotal role in setting and achieving high standards in H&S and research shows that clients do undertake a range of H&S interventions and institute a range of H&S requirements impacting on contractors. However, noting that in August 2007 'blitzes' that some 52,5% of sites were non-compliant brings into question the extent of client influence.
- The Construction Regulations provide for the client appointing an agent to act as his/her representative in terms of the responsibilities imposed by the Regulations. However, the ability of the agent to impact on construction H&S is influenced by the competence or experience of the agent, resources, and/or ability to influence the necessary outcomes. The Regulations do not prescribe the minimum competencies of the agent.
- Construction H&S performance is influenced by the H&S specification and communication of H&S expectations and requirements from one participant to the other and importantly on the effective monitoring of compliance with these expectations.
- Research suggests that the influence of project managers, as well as designers, on H&S is more frequently during construction than on procurement and design-related issues - but that there is need and scope for project managers and designers, as well as quantity surveyors, to further influence H&S.
- Specific needs identified include pre-qualification or selection of contractors on H&S and quality, including a specific mention of and a financial allowance for H&S in contract documentation, avoiding competitive tendering and realising the implementation of QMSs in design and construction.
- Strengthening the influence of project managers and designers in construction H&S requires leadership, guidelines and tools, capacitation, and legislative interventions.
- Although many examples of best practice exist, lack of management commitment, supervisory environment, and training and competence level are major sources of poor construction H&S performance.
- Anecdotal evidence indicates that the medium to large, and large contractors and subcontractors tend to address H&S to a greater degree than small contractors, emerging contractors and the majority of housing contractors.
- Positive actions and commitment to H&S by a main contractor and the integration of these into all activities including those of subcontractors are key factors to strengthen H&S actions within subcontractors. On the other hand, the H&S performance of subcontractors impacts heavily on the H&S performance of a main contractor and in the absence of effective subcontractor management the performance of principal contractors is negatively affected.

STAKEHOLDERS CONTRIBUTIONS

H&S is a legislative issue, construction H&S is impacted upon by a number of stakeholders; it is therefore not only the responsibility of the DoL to maintain safe and healthy work places. The construction industry stakeholders have taken ownership of construction H&S to a large degree, more specifically the employer associations, i.e. the MBSA, the MBAs and SAFCEC who have contributed to construction H&S by promoting H&S to their members in the form of training, awareness, competitions, and H&S coordinators. Construction H&S has received wide publication in the media in recent years, making the workers and the general public more aware of the number of fatalities and injuries occurring in the construction industry.

Other stakeholders have contributed to construction H&S to various degrees as is described below.

EMPLOYER ASSOCIATIONS

a) The Master Builders South Africa (MBSA) (previously the Building Industries Federation South Africa; BIFSA) and the Master Builders Associations (MBAs) have historically provided substantive H&S services to its members. Initially, BIFSA established a Safety and Loss Control division in the 1980s, which promoted H&S to its members on the basis of safety and loss control, the emphasis being relative to loss control. The rationale being that by citing the potential losses relative to labour, materials and plant and equipment as a result of not implementing the requisite preventive measures, contractors would address H&S issues. Shortly thereafter, BIFSA launched a safety and loss control star grading scheme and a regional and national safety and loss control competition. Safety and loss control consultants were employed in the regional offices, who reported to the national coordinator. The MBSA H&S coordinator coordinates the activities of the regional H&S advisors in the employ of the MBAs.

"The year 1964 may or may not signify much to the world in general, but future generations of builders will surely look back on it as a watershed. It is the year of positive decision. The year in which building employers made up their minds as a man to stop the wasteful accidents. This was the year when the industry established its own national safety sub-committee with the express mandate of teaching its entire labour force how to work safely."

NOSA (1964)

During recent years the East Cape MBA has trained on average 150 first aiders, 220 scaffold inspectors, and 380 H&S Representatives per year.

The MBSA and the MBAs strive to promote a positive OH&S culture which contributes to the elimination of occupational injury, disease, loss and the prevention of damage to the environment by:

- informing members of new OH&S legislation;
- providing OH&S advice and guidance;
- assisting contractors to improve their OH&S programmes and procedures;
- conducting site OH&S surveys and audits;
- conducting an annual national OH&S competition;
- assisting members with incident investigations and reports;
- arranging forums and workshops on informative OH&S topics; and
- coordinating OH&S training courses.

The MBSA has also produced an *Occupational Health and Safety Manual for Construction Sites,* which is used by the DoL inspectors as a training aid and is available from the MBSA and the local MBAs. The regional MBAs regularly hold H&S training programmes, for example, the Health and Safety Programme for Construction Managers (HSPCM), a six day training certificate offered by the University of the Free State in conjunction with the Gauteng Master Builders Association.

The MBAs appointed H&S advisors in the mid to late 1990s, which were funded by the Federated Employers Mutual Assurance Company Limited (FEMA). The H&S advisors promote H&S to the MBA members, advise members and conduct inspections. The MBAs also manage the regional H&S competitions and star-grading programmes.

The competitions and star-grading programme had a positive impact on construction H&S performance in that a study[46] determined that there was a statistically significant relationship between H&S competitions and cited H&S performance, and between H&S star-grading programmes and cited H&S performance.

2008 MBSA National Safety Awards (National Winners)

Contractor	Project	Category
Group 5 KZN/WBHO/Pandev JV	Moses Mabhida Soccer Stadium Durban	>R500 million
Grinaker-LTA East/Enza JV	Bridgecity Mall, Ntizama, Durban	R200 - R500 million
Stefanutti & Bressan Building (PTY) Ltd	Liberty Life Offices, Umhlanga	R120 - R200 million
NMC (PTY) Ltd	Bidprop Warehouse, Cape Town International Airport	R50 - R120 million
NMC (PTY) Ltd	Waterkloof Winery, Somerset West	R20 - R50 million
Stefanutti & Bressan Building (PTY) Ltd	Gottlieb Warehouse, Riverhorse Valley - Avoca	R5 - R20 million
Patcon Building and Civil Engineering (PTY) Ltd	Engen Refinery, Durban	<R5 - R20 million

Adapted from: MBSA Annual Report, 2008

The MBSA together with the MBAs strive to make a very important contribution to construction H&S but the uptake of the MBAs efforts has been questioned by the MBAs themselves:

> *Speaking at the Gauteng annual Regional Safety Competition awards presentation in Midrand, Neil Duncan (president of the Gauteng Master Builders Association (GMBA)), said it was gratifying that there seemed to have been an improvement in safety compliance at principal-contractor level, but awareness about safety on site was still not prevalent throughout the industry. Only 23 companies and 40 sites (out of a total membership of 700) entered the GMBA's regional competition this year.*
>
> *'Safety and health still neglected on building sites' Engineering News, 22 September 2006*

b) The South African Federation of Civil Engineering Contractors (SAFCEC) has historically also provided an H&S service to its members. Services provided include H&S legal compliance audits, compilation of H&S plans based on client H&S specifications, the design and implementation of formal OH&S programmes and systems, and conducting workshops relative to legal requirements.

The following products are also available to SAFCEC Members to supplement OH&S requirements:

- The OH&S Construction Manual;
- Appointment forms as required by the Construction Regulations;
- Registers and checklists;
- A complete Construction OH&S Audit System;
- Risk Assessment - A guide for Understanding the Basics;
- Guide to Contractor Indemnity Undertaking (Sect. 37(2)) Agreement; and
- H&S posters.

SAFCEC also presents regular H&S training courses, including:

- Gold Card - Manage the H&S of a construction project;
- Green Card - Supervise the H&S on a construction project; and
- Red Card - H&S awareness for all working staff.

REGISTRATION COUNCILS

Generally, with the exception of the Engineering Council of South Africa (ECSA) a lack of evidence suggests that the South African Built Environment Councils established in terms of the Council for the Built Environment Act are not contributing to H&S.

Historically, the ECSA has investigated *inter alia*, accidents on projects involving design engineers. Such cases include the 2003 Injaka bridge collapse[47], the 2004 Cleveland bridge collapse, the 2001 Kolonnade shopping centre roof collapse and the 2003 Coega bridge collapse. Should any individual be found guilty of contravening the council's Code of Professional Conduct, a number of actions could be taken, ranging from an official warning to permanently removing the person's name from the council's register.

Councils in turn, should ensure that H&S is addressed in tertiary education and continuing professional development (CPD) programmes[48].

> *Councils should require that H&S is addressed in tertiary education and continuing professional development (CPD) programmes.*

PROFESSIONAL AND VOLUNTARY ASSOCIATIONS

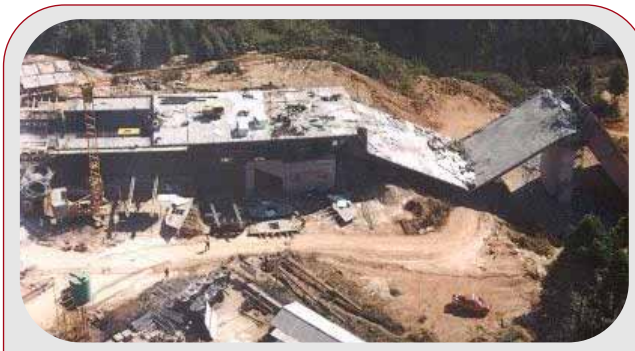
Professional and voluntary associations have a strong role to play in promoting the practice of construction H&S. For example, in the UK the Chartered Institute of Building (CIOB) adopted the view that "The approach to Health and Safety should be demonstrated as a core commitment to the management of academic provision and to the delivery teaching and learning." Furthermore, the CIOB launched the "Change in our Sites" campaign in 2003 to identify the change needed in the construction industry to raise standards in site conditions[49].

Safety in Numbers in Construction

Where there has been a demonstrable commitment by owners, contractors and other role players to a policy of "zero harm", much improved results are evident on their projects. What is needed to bring about real improvement, and thus improve the image of construction, is the adoption of a health and safety culture as well as the personal commitment by all members of the Institution.

Mike Deeks
President SAICE 2005

In general, voluntary associations in South Africa are not contributing significantly to construction H&S albeit at best on a 'sporadic' basis. One such example of commitment was the Presidential Theme of "Safety in Numbers in Construction" of Mike Deeks, President of the South African Institution of Civil Engineering (SAICE) in 2005.



Injaka Bridge Collapse (1998): Lessons Learned: The Injaka Bridge in Mpumalanga collapsed on 6 July 1998, causing the death of 14 people (including the designer of the bridge, Ms Marelize Gouws) and injuring 19 others. Most of them were standing on the bridge deck as it was being launched.

After 4 years of investigation, the Injaka Bridge collapse inquiry in terms of the provisions of section 32 of the Occupational Health and Safety Act was at last made public in mid-May 2002. Adv. Hans Fabricius and his legal team found both parties, the consulting engineers and the contractor, negligent in a number of ways.

The causes of the collapse resulted from a long list of shortcomings and can be summarised as follows:

- Lack of competent personnel and supervision.
- Steel launch nose not structurally stiff enough incorrect temporary works slide path.
- Incorrectly placed temporary bearings.
- Incorrect feeding of bearing pads.
- Under-designed deck slab.

All of the above could have been avoided had normal design and project management principles been applied.

Injaka

Source: Terry Deacon, ProjectPro

Many professional and voluntary associations have a statutory or influential role in accreditation of tertiary education courses. In such cases, these associations should require, or facilitate, that related tertiary education and continuing professional development (CPD) programmes should address H&S. Professional and voluntary associations could also contribute significantly by providing H&S related practice notes and guidelines[50].

Professional and voluntary associations could contribute to H&S providing H&S related practice notes and guidelines.

In order to address the lack of focus on construction H&S by existing associations, the Association of Construction Health and Safety Management (ACHASM) was launched at the 4th South African Construction Health and Safety conference in October 2007. ACHASM's primary objective is to promote professionalism and leadership in construction H&S, and is currently promoting registration of members relative to H&S criteria, the identification of work, establishing fee scales, facilitation of H&S training, and promotion of CPD.

ACHASM's primary objective is to promote professionalism and leadership in construction H&S.

A broader based organisation is the Institute of Safety Management (IoSM), a professional association for H&S practitioners. IoSM registers a range of membership categories and provides for professional registration.

EMPLOYEE ASSOCIATIONS

The trade union movement in the UK has set up several schemes to promote closer working between employers and union members[51]. Examples include "Partners in Prevention" run in conjunction with the "Revitalising Health and Safety in Construction" campaign, which entails employers and trade unions working together to achieve common goals such as higher H&S standards, better working conditions and a reduction in accidents and ill health. The initiative involves solving both individual and collective H&S problems. Another initiative is the "Union Learning Representatives" scheme, in which learning representatives support people in their workplace to improve their skills by providing information, advice, guidance and support.

Employee associations have only contributed sporadically to H&S and often only on high-profile projects. More could be done by employee associations to empower their members through raising awareness relative to H&S,H&S training and establishing forums with the management of contracting organisations.

By comparison with the initiatives in the UK, there is very little active participation by employee associations in South Africa addressing construction H&S. One such initiative involving employee associations was the Construction Industry Occupational Health & Safety Forum (CIOHSAF), which was founded in August 1995 in an endeavour to integrate H&S efforts in the broad construction industry. It was constituted by *inter alia*, the African Builders Association (ABA), the Building Construction & Allied Workers Union (BCAWU), BIFSA, the Construction Allied Workers Union (CAWU), FEMA and SAFCEC. It evolved in 1997 into the Construction Occupational Health-Safety-Environment Forum (COHSEF) but was disbanded in 2000.

Notwithstanding this, BCAWU, the National Union of Metalworkers of South Africa (NUMSA) and others have contributed sporadically to H&S but often only on high-profile projects which suggest that construction H&S is not a value.

Employee associations should follow the example of their international counterparts in terms of empowering their members through raising awareness relative to H&S, H&S training and establishing forums with the management of contracting organisations.

MANUFACTURERS AND SUPPLIERS

Internationally, materials and product manufacturers and suppliers can significantly influence construction H&S. For example, developments over a period of two decades include:

- the palletisation of stock or common bricks and off-loading by means of a crane mounted truck in lieu of transport and delivery by tip truck;
- the advent of pre-fabricated timber roof trusses reduced the amount of work at elevated heights required relative to timber trusses assembled in-situ;
- the development of a cold-rolled light-weight galvanised steel roof truss system, which beside a range of quality and cost benefits, ultimately dispenses with the need for cranage during erection and averts extraneous manual handling[52];
- powered aerial access platforms (PAAPs) which essentially enable access for work at elevated heights; and
- the design of earthmoving equipment to enhance operator body posture and movements, and to mitigate the impact of vibration on the body.

Source: Anonymous

The manufacturing industry needs to continue to promote the benefits of products such as these to the construction industry, but further potential contributions to H&S and ergonomics by plant and equipment manufacturers and suppliers will, to a large extent, depend on design and the reengineering of the construction process.

TERTIARY INSTITUTIONS AND COLLEGES

Ideally, construction H&S should be offered as a separate subject or as an identifiable component in a subject within construction management, civil engineering, project management and quantity surveying programmes. Ideally, architectural programmes should include H&S as an identifiable component of design and professional practice. H&S should also be included among the criteria used for evaluating design projects, working drawings and details.

Within South Africa, construction management programmes generally include H&S, primarily as a component of the subject construction management, but also as a module in other subjects[53]. H&S is addressed mostly at third-year level, while in some programmes at the fourth-year level.

Construction H&S should be included as a separate subject or as an identifiable component in all construction management, civil engineering, quantity surveying and architecture programmes.

Approximately half of civil engineering programmes include H&S in their programmes[54], typically at the second-year level as a component of a subject. Similarly, approximately one-third of architectural programmes address H&S, largely as a component of a subject[55]. Further Education Training (FET) colleges address the OH&S Act in the National Certificate Vocational (NCV) Construction and NCV Electrical.

In terms of specialisation, the Cape Peninsula University of Technology (CPUT) offers a BTech Construction Management specialising in Construction H&S Management, while the Nelson Mandela Metropolitan University (NMMU) offers the specialisation Construction H&S Management within the MSc (Built Environment) programme. The University of Pretoria BSc (Honours) Construction Management programme includes a half-year subject "Industrial Safety".

Certain tertiary institutions also foster a range of H&S and ergonomics related postgraduate studies. The CPUT and the NMMU have a large cohort of Masters and Doctoral students undertaking such studies.

THE CONSTRUCTION EDUCATION AND TRAINING AUTHORITY (CETA)

The primary objective of the CETA is "to influence the course of training and skills development by ensuring that all training reflects the current sectoral needs and requirements of the construction sector". Noting the lack of H&S training at tertiary institutions and colleges (see above) and amongst, for example, site workers, it is clear that the CETA has not influenced the course of construction H&S training and skills development.

MEDIA

The summer 2007/2008 issue of the Master Builders KwaZulu-Natal Newsletter dedicated five of eleven pages to H&S.

The Health and Safety Executive (HSE)[56] emphasises the role of the media and publicity in improving H&S, particularly amongst small firms and the self-employed in the UK. Key interventions include paid advertising using images designed to capture the attention of small firms and workers placed on billboards, tabloid newspapers, petrol pumps and other key locations, and articles in free publications available from builders' merchants who uses cartoons and simple bullet point advice.

Within South Africa, studies have shown that construction trade magazines and journals do include quite significant editorial to promote construction H&S, primarily in the form of articles. Employee body magazines and newsletters also devote quite significant attention to H&S often on a regular basis. The news media also report on construction H&S; albeit more speculative newsworthy construction accidents.

INTERNATIONAL LABOUR ORGANIZATION (ILO)

While promoting individual and collective rights at work, social protection and OH&S, the ILO encourages social dialogue and supports an open and constructive industrial relations policy between governments, employers and workers. The ILO conducts research into these and a range of other issues in the ever changing world of work and publishes the results in the form of timely and authoritative publications, reports, training manuals, CD-ROMs, videos and e-books. ILO research contributes internationally and within South Africa to enhance awareness of crucial labour and employment issues in subject areas such as H&S. While focusing primarily on employment in the global economy, the ILO publications programme provides relevant research findings and practical solutions to workplace problems for workers and employers in developing, transition and industrial economies.

INTERNATIONAL COUNCIL FOR RESEARCH AND INNOVATION IN BUILDING AND CONSTRUCTION (CIB)

The International Council for Research and Innovation in Building and Construction's (CIB) Work Group 99 (Safety and Health in Construction) is particularly active internationally and within South Africa and has contributed significantly to H&S research and practice in South Africa. In particular, the 4th Triennial International Conference of CIB Working Commission 99 was staged in Port Elizabeth, May 2005 and attracted some 150 academics and practitioners.

SUMMARY

- Employer organisations, including the MBSA, the MBAs and SAFCEC have made significant contributions to construction H&S.
- Employee associations have only contributed sporadically to H&S and often only on high-profile projects.
- Professional and voluntary associations in South Africa have not contributed significantly to construction H&S; albeit at best on a 'sporadic' basis.
- Generally, with the exception of the Engineering Council of South Africa (ECSA) a lack of evidence suggests that the South African Built Environment Councils established in terms of the Council for the Built Environment Act are not contributing to H&S.
- The manufacturing industry needs to continue to promote the H&S benefits of its products to the construction industry.
- The CETA has not influenced the course of construction H&S training and skills development.
- A range of international organisations, including the ILO and the CIB have made significant contributions to construction H&S in South Africa.
- Construction H&S is included as a separate subject or as an identifiable component in many, but not all, construction management, civil engineering, quantity surveying and architecture educational or tertiary programmes.
- The media have contributed to H&S and not just in terms of sensationalist reporting, which indicates a level of awareness relative to H&S.

ENCOURAGING AND PROMOTING CONSTRUCTING HEALTH AND SAFETY

Previous sections in this report have highlighted the role and contributions made by various stakeholders in encouraging and promoting construction H&S. Most notable of these include industry associations such as the MBSA, the regional MBAs, and SAFCEC but they deal primarily with their members. The report has, however, also highlighted the need for a developmental role in the construction industry to support, in particular, small and emerging contractors; many of whom fall outside of the membership of industry associations.

This section of the report examines local and international mechanisms for encouraging, promoting and supporting construction H&S.

CERTIFICATION, ACCREDITATION AND ASSESSMENT

Over the years local authority health and safety and procurement professionals, with the support of the Health and Safety Executive, have developed the Contractor Health and Safety Assessment Scheme (CHAS). The scheme is available for use by any public and private sector organisations to use when shortlisting contractors, suppliers and consultants (companies) who apply to work for them. It provides information about the health and safety part of their application.

Companies apply to join the scheme so everyone knows they meet acceptable standards of health and safety compliance. Clients from both the public and private sectors are users of the scheme.

CHAS (UK), 2008

Second or third part certification of H&S Management Systems is becoming increasingly common in managing H&S performance within a company and as a requirement for the pre-qualification and selection of contractors. One of the more well-known H&S certification systems is the OHSAS 18000 standard.

Although there is no internationally agreed upon (or ISO) H&S standard, the OHSAS 18000 standard has been adopted as the basis for many local standards, such as BS8800. However, just a few construction companies in South Africa are OHSAS 18000 certified, for example, various units within Murray and Roberts and within Grinaker-LTA[57]. More companies are ISO 9000 certified which also contributes to improvements to construction H&S.

Clients are increasingly adopting requirements for certified or accredited management systems, including H&S management systems, as a means of pre-qualification of contractors depending on the degree of complexity of the construction project and the likely consequences of non-conformance. Clients include the NSW and Queensland governments in Australia, the public sector in Singapore and the UK government.

Clients are increasingly adopting requirements for certified or accredited management systems, including H&S management systems, as a means of pre-qualifying contractors.

Notwithstanding some international debate about whether certified or accredited management systems do in fact provide some level of comfort regarding a contractor's ability, the general consensus around the world is that pre qualification of contractors based on certified or accredited management systems is an important component of a client's risk management and in encouraging performance improvement.

"Some sites will adapt method statements. Some companies go down the paper trail, but do not necessarily appreciate what is required. Better companies often have less paperwork as what is produced is more focused. Whilst the law is being complied with by many organisations, the spirit of law is not always followed. … The best hope is for a structured approach where there will be a need to stop, think and plan."

HSE (UK), 2004

GRADING AND RATING SYSTEMS

In South Africa, investigations were carried out with the intention of reducing the terrific waste of human resources in the 1950s, which led to the establishment of the National Occupational Safety Association (NOSA) in 1951, which was funded partly by the State Accident Fund[58]. NOSA was liquidated in April 2005 and all the intellectual property and trademarks were acquired by Micromega.

The mandate of NOSA is *inter alia* to promote H&S, provide H&S training, provide H&S auditing and certification, and to render a H&S advisory service. NOSA also runs the NOSA Grading System which focuses on the programme status and the Disabling Incident Frequency Rate (DIFR) of the company. NOSA awards a star rating based on the following criteria as shown in the table below:

NOSA Rating System

Effort %	DIFR (experience)	Number of stars
> 95	< ,8	NOSCAR Status
> 91	< 1	5 Star: Excellent
> 75	< 2	4 Star: Very good
> 61	< 3	3 Star: Good
> 51	< 4	2 Star: Average
> 40	< 5	1 Star: Fair

Contractors that were awarded NOSA 4, 5 and NOSCAR ratings in 2007 are given below. The small amount of contactors with NOSA awards is not necessarily an indication of poor H&S amongst contractors but rather an indication of a lack of uptake of the NOSA rating system by contractors.

NOSA 4, 5 and NOSCAR ratings in 2007

Company/Site	NOSA Grading
Apollo E&I Construction	5
Encore Engineering (Pty) Ltd	5
Fukula Construction	4
Grinaker-LTA Civil Eng	5
Harrison & White Contractors	4
Jet Demolition	Noscar
Lynco Projects	4
OTB Construction	5
Scribante Construction (Pty) Ltd Richards Bay	4
Sibathathu Construction (Pty) Ltd Trichardt	4
Stefanutti & Bressan Civils Secunda	4
Stefanutti & Bressan Earthworks	4
Steinmuller Eng Serv Sasolburg	4

Source: NOSA, 2008

RECOGNITION SCHEMES

Various recognition schemes exist around the world that promote and recognise good practice of contractors. One such scheme is the Considerate Constructors Scheme (CCS) in the UK that entails the monitoring of all sites registered with the Scheme by an experienced industry professional to assess their performance against an eight point Code of Considerate Practice, which includes the categories of considerate; environment; cleanliness; good neighbour; respectful; safe; responsible and accountable.

The CCS is becoming increasingly more recognised in the UK, with over 650 sites signed up to the Scheme in January 2008; a new record for the number of sites registering with the CCS in a single month. The CCS plans to increase take up of the Scheme from currently just over 40% in 2007 of the construction value of all eligible UK sites to 60% by 2010[59].

Consideration should be given to introduce and/or support existing recognition schemes that would promote construction H&S by supporting initiatives within the MBAs and SAFCEC and/or through the cidb Best Practice Project Recognition Scheme. Importantly, however, such schemes should reach small and emerging contractors as well.

Recognition schemes that promote construction H&S should be encouraged.

SKILLS ASSESSMENT SCHEMES

Section 7 of the Construction Regulations (2003) requires that:

(7) … no contractor shall allow or permit any employee to enter any site, unless such person has undergone health and safety induction training pertaining to the hazards prevalent on the site at the time of entry.

(9) Every employee on site shall:

(a) be in possession of proof of the health and safety induction training … issued by a competent person of the contractor prior to the commencement of construction work; and

(b) carry the proof contemplated in paragraph (a) for the duration of that project or for the period that the employee will be on the construction site.

Many clients and contractors around the world are adopting schemes requiring site staff to have skills assessments, including H&S. For example, the Construction Skills Health & Safety Test in the UK is taken by over 500 000 people every year and is designed to ensure everybody working in construction has a minimum level of H&S awareness at an industry acceptable standard. Different schemes exist for plant operators, scaffolders, demolition operatives, etc., but all card schemes require a H&S Test as a component. Passing the test is an essential part of qualifying for the major card schemes in the UK such as Construction Skills Certification Scheme (CSCS) and affiliated schemes. Although these are voluntary schemes, it is increasingly being used as a minimum requirement for site staff in major UK construction companies.

Similar requirements also exist in other countries, for example in Queensland, Australia, in which H&S is an integral component of obtaining a builder or trade license.

Although the Construction Regulations in South Africa require all employees on site to "be in possession of proof of the health and safety induction training" no industry accepted standard exists. Verification of this requirement is also left to DoL inspections. Verification of H&S skills and awareness should be incorporated into the cidb Best Practice Contractor Recognition Scheme.

An industry accepted standard needs to exist in South Africa to verify that site workers have a minimum level of H&S awareness.

TARGETS, KPIs AND BENCHMARKING

The concept of national targets has been used in many countries to drive performance improvement; most notably in the UK and Singapore.

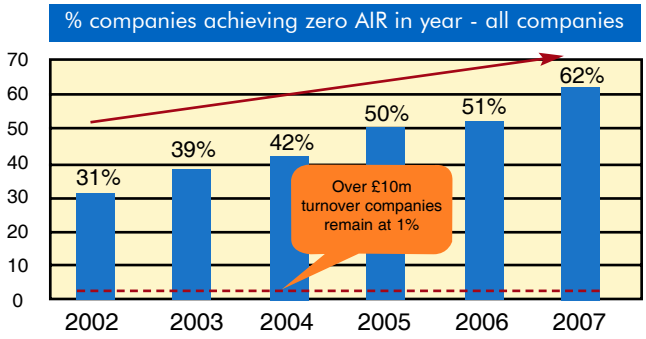
UK Government Targets for Improvements in Workplace H&S

Target	Reduction by (%)	
	2004/5	2009/10
Reduce the incidence rate of fatal and major injury accidents	5%	10%
Reduce the number of working days lost per 100 000 workers from work-related injury and ill health	15%	30%
Reduce the incidence rate of cases of work-related ill health	10%	20%

Source: Health and Safety Executive (2004)

In the UK, attaining these targets has been supported by the annual publication of Key Performance Indicators (KPIs), which include headline indicators of reportable accidents and zero accident incident rates (AIRs). The measurement of KPIs is encouraged on all public sector contracts.

National targets and KPIs have certainly contributed to an awareness of H&S and there is a strong apparent trend in the H&S KPIs over recent years. In the UK, the KPIs have also laid the foundation for benchmarking by companies.



However, it should be noted that the headline KPIs are usually outcome indicators (such as reportable accidents) and for benchmarking purposes these need to be supported by benchmarks measuring the management of H&S in the workplace (such as the percentage of a workforce that has received H&S training).

The cidb Construction Industry Indicators (CIIs) do not include an H&S indicator but are currently being extended to include H&S indicators through the cidb Contractor Performance Reports.

Studies in South Africa[60] among 'better practice' general contractors and members of the Association of Construction Project Managers (ACPM) showed that about half of the general contractors that responded, do benchmark H&S or compared projects in terms of H&S on a monthly basis. Approximately one-third never did so.

REPORTING

Reporting by companies on H&S performance to common standards is widely viewed as contributing to performance improvement. In the UK, the Health and Safety Commission (HSC) has issued guidance on H&S in Annual Reports. The guidance strongly urges organisations (with more than 250 employees) to report as a minimum:

- the broad context of the H&S policy;
- the significant risks faced by employees and others and the strategies and systems in place to control them;
- the H&S goals and targets;
- progress towards achieving these goals and targets; and
- arrangements for consulting employees and involving H&S representatives.

The HSC reporting guidelines are consistent with (and in fact been superseded by) the reporting guidelines contained by the Global Reporting Initiative (GRI) and in King II.

While most (publicly listed) South African construction companies do report on H&S in their annual reports, the reporting in many cases is often limited to company policy, targets and H&S awards. Not all the companies report on actual H&S statistics, such as Disabling Injury Frequency Rates (DIFR) and Lost Time Injury Frequency Rates (LTIFR).

Annual reporting on construction H&S by companies should be encouraged for both public listed companies and private companies, through, for example, the cidb Best Practice Contractor Recognition Scheme.

cidb registered contractors should be encouraged or required to report on construction H&S statistics annually.

HEALTH AND SAFETY AGENCIES

Many agencies exist around the world with a mandate to:

- regulation, inspection, investigation and enforcement; and/or
- promotion, awareness, information and advice, and promotion of research.

Examples include:

- the Health and Safety Executive (HSE) in the UK, a government entity whose mandate covers research, information and advice, promoting training, new or revised regulations and codes of practice, inspection, investigation and enforcement;
- the Occupational Safety and Health Administration (OSHA) in the USA, with a similar mandate to the HSE;
- the Australian Safety and Compensation Council (ASCC), a partnership of governments, employers and employees that leads and coordinates national efforts to prevent workplace death, injury and disease (the ASCC is not a regulatory authority and does not make or enforce laws); and
- Site Safe in New Zealand, an industry based society whose mandate is to assist all participants in the construction industry in New Zealand to reduce the rates and consequences of injuries by providing consultancy, auditing, advisory and training services.

Site Safe New Zealand has a four step plan for construction safety:

- *Provide industry leadership in health and safety.*
- *Provide nationwide health and safety training.*
- *Promote best practice and a safety culture in the industry.*
- *Work with Government to create incentives for industry compliance and be the industry's health and safety voice.*

Within South Africa, providing information and advice; raising awareness; and promoting training is largely undertaken by employer associations. While their important role is acknowledged and needs to be supported and strengthened by bodies such as the DoL and the cidb, it is recognised that small and emerging contractors fall outside of their sphere of influence. A far more coordinated industry-wide effort is required.

H&S AWARENESS CAMPAIGNS

An important component of raising awareness and promoting construction H&S typically used by H&S agencies is that of H&S awareness campaigns, such as the following:

- The Safety and Health Awareness Days (SHADs) undertaken by the HSE[61] targeting small businesses with less than 10 employees and sole traders. The objectives of the SHADs were to raise awareness, improve knowledge and gain commitment to action. The follow-up evaluation found that the average number of attendees to SHADs who have implemented H&S changes is 88% of those surveyed; and
- Safe Work Australia Week undertaken by the ASCC, which is a national week focusing attention on workplace safety issues around Australia. It aims to encourage all working Australians to get involved in, and concentrate on, safety in their workplace to reduce death, injury and disease. In 2008, a key focus of the Safe Work Australia Week was on the new "National Standard for Construction Work" in Australia - the equivalent South African Construction Regulations.

Within South Africa, there is no national campaign that has a focus on construction H&S, including (to date) the National Construction Week.

BEST PRACTICE GUIDELINES

Internationally, there is a wealth of information and best practice guidelines that construction H&S practitioners can access. Some of the more commonly known and used information is that provided by, for example:

- the Health and Safety Executive (HSE) (UK) (http://www.hse.gov.uk);
- Constructing Excellence in the Built Environment (UK) (http://www.constructingexcellence.org.uk)
- the Construction Industry Research and Information Association (UK) (http://www.ciria.org.uk)
- the National Institute for Occupational Safety and Health (NIOSH) (USA) (http://www.cdc.gov/niosh/topics/construction)
- the CRC for Construction Innovation (Australia) (http://www.constructingexcellence.org.uk)

Overseas best practice guides need to be promoted, but may need to be adapted to local conditions.

Notwithstanding the information sources that are available locally from the MBAs, SAFCEC and others, in comparison with overseas there is a paucity of information available in South Africa or at least a recognised information hub is missing in South Africa. Furthermore, while this overseas information is relevant to the South African construction industry, there is a need to adapt or supplement this information for local conditions and to promote this information locally.

RESEARCH AND DEVELOPMENT

R&D is fundamental to underpin performance improvement and there are many programmes internationally that support construction H&S.

In the USA, the National Occupational Research Agenda (NORA)[62] is a partnership programme to stimulate innovative research and improved workplace practices in the USA. Unveiled in 1996, NORA has become a research framework for the National Institute for Occupational Safety and Health (NIOSH) in the USA. The most recent priorities for the NORA construction sector group addresses14 strategic goals designed to target the 10 'top' problems, namely: falls; electrocution; struck-by injuries; noise and hearing loss; silica exposures and illnesses; welding fumes and associated illnesses; musculoskeletal disorders; construction culture; construction safety and health management; construction industry and work organisation; training issues; vulnerable workers; construction hazards prevention through design; and surveillance of hazards and outcomes[63].

The CRC for Construction Innovation in Australia, a government and industry initiative, has a strong focus on construction H&S, and has recently completed a R&D programme on construction H&S resulting in the production of *A Practical Guide to Safety Leadership, Guide to Best Practice for Safer Construction: Implementation kit and A Construction Safety Competency Framework: Improving OH&S performance by creating and maintaining a safety culture.*

Of interest, The Safety in Mines Research Advisory Committee, known as SIMRAC, in South Africa was established in terms of Mine Health and Safety Act No. 29 of 1996 with the principal objective of advising the Mine Health and Safety Council (MHSC) on the determination of the safety risk on mines and the need for research into safety on mines based on the safety risk. SIMRAC is predominantly funded from a levy on every registered mine depending on its safety risk[64], and the annual budget of SIMRAC is around R40m p.a.[65].

Highlighting SIMRAC in this report is important, as the accident incident rates in the mining and construction sectors are not too dissimilar. However, there is currently no national R&D agenda focusing on construction H&S or targeted R&D funding stream.

The need for an R&D agenda which includes construction H&S has been recognised by the cidb and is receiving attention.

SUMMARY

- Second or third part certification of H&S Management Systems is becoming increasingly common as a requirement for the pre-qualification and selection of contractors.
- Notwithstanding the advantages, there is a lack of uptake of the NOSA rating system by contractors.
- Various recognition schemes exist around the world that promote and recognise good practice of contractors and participation in these is becoming increasingly more common.
- Many clients and contractors around the world are adopting schemes requiring site staff to have skills assessments, including H&S.
- National targets, including H&S targets, have been used very successfully in countries such as the UK and Singapore to drive performance improvement.
- Reporting by companies on H&S performance to common standards is widely viewed as contributing to performance improvement and should be encouraged for both publically listed companies and private companies, through, for example, the cidb Best Practice Contractor Recognition Scheme.
- Many national agencies exist around the world with a mandate for promotion, awareness, information and advice, and promotion of research in construction H&S, whereas in South Africa this is currently being undertaken by raising awareness; and promoting training is largely undertaken by employer associations.
- Notwithstanding the information sources that are available locally from the MBAs, SAFCEC and others, there is a paucity of H&S best practice information and guides available in South Africa.
- There is a need for a national R&D agenda which includes construction H&S in South Africa.

IMPROVING CONSTRUCTION HEALTH AND SAFETY IN SOUTH AFRICA

OVERVIEW

Worldwide construction contributes a disproportionate number of injuries. However, construction in developing countries, South Africa included, performs worse than construction in developed countries. Furthermore, there is a high level of non-compliance with H&S regulations in South Africa. Research findings indicate that, at the organisational and site level, this poor construction H&S performance is attributable to a lack of management commitment, inadequate supervision, and inadequate or a lack of H&S training. A lack of worker's involvement, personal risk appreciation and work pressures also contribute to poor performance.

Management and leadership at all levels are crucial to improve construction H&S in South Africa. Leadership needs to manifest itself among all stakeholders, starting with clients and including project managers, designers, quantity surveyors, contractors, manufacturers and suppliers. The CoA contributes substantially to the cost of construction, which itself constitutes a financial motivator to all stakeholders (including clients) to address H&S. However, the pre-occupation with cost, quality and time by stakeholders marginalises the potential realisation of the benefits of optimum H&S in the form of enhanced overall performance. The high level of non-compliance in construction indicates that there is a lack of understanding and appreciation for the synergistic role of H&S and ultimately, the business case for H&S.

Internationally and in South Africa, the poor H&S performance is often attributed to a low level of 'respect for people' in construction in which the workforce is treated as a low value, transient resource with little investment in their development and insufficient attention to their wellbeing[66].

A pre-requisite for enhancing H&S management and leadership is awareness, including awareness of the following:

- the role of H&S in the overall business performance of a company and the CoA (which is ultimately passed onto clients);
- H&S regulatory requirements and the responsibilities of various stakeholders; and
- the tools and techniques that can be used to enhance construction H&S performance.

Public H&S reporting is an important tool in demonstrating and in promoting management commitment and can also enable an organisation to enhance the trust of its workforce, its investors and the public, and in doing so benefit its reputation. At present in South Africa many, but not all, of the public listed construction companies (typically Grade 9 companies) do report on H&S against standard reporting protocols such as King II and the GRI.

Specific attention needs to be given to small and emerging contractors, who typically have limited resources to provide for H&S and whose H&S processes will typically be less structured and based rather on prior contract experience. A developmental approach is needed to support the small and emerging contractors.

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. In order to achieve an improvement in construction H&S, attention needs to be given to improve on-site supervision and education and training in H&S. Achieving improvements in these areas is challenging given the current skills deficit and expertise differential in the sector. In the latter case, the differences are marked relative to management skills and experience between the formal developed and informal underdeveloped sectors and particularly SMMEs. Again, a developmental approach is needed to support the small and emerging contractors.

South Africa's legislative framework addresses H&S at three levels, firstly in terms of the national constitution, then in terms of Acts such as the OH&S Act and the COID Act, followed by regulations such as the Construction Regulations. Clearly South Africa is not lacking in terms of H&S legislation. Although the Construction Regulations have had an impact but not the desired impact relative to clients, designers and quantity surveyors, and to a degree on subcontractors. The Construction Regulations need to be amended to promote optimum H&S throughout all phases of a project, in particular the concept, initiation and detailed design phases. Furthermore, the lack of guidelines to accompany not only the Construction Regulations but other generic H&S regulations has marginalised their impact.

The OH&S Inspectorate's mandate is to ensure that the objectives of the OH&S Act No. 85 of 1993 are realised, namely the H&S of persons at work and the H&S of persons using plant and machinery. The mandate includes inspections, investigations, enquiries and the initiation of legal proceedings. Furthermore, they are mandated to issue improvement, contravention and prohibition notices. The OH&S Inspectorate is understaffed and lacks the requisite construction expertise and research findings indicate that they are more ineffective than effective. In essence, the OH&S Inspectorate needs to be re-engineered.

Although the main function of the Compensation Fund is to compensate workers for disablement caused by occupational injuries or diseases sustained or contracted in the course of employment, or their families in the case of death resulting from such injuries or diseases[67], the Compensation Fund has often been criticised for poor performance in terms of payment of claims. More recently, an article *Patients in dire straits Compensation Fund obsolete?* states: "…, it is evident that the fund is completely dysfunctional."[68]

There is a lack of comprehensive H&S statistics relative to construction and for that matter, all industries. Furthermore, the most recent statistics available from the Compensation Commissioner are for the year 1999. Furthermore, the Compensation Fund is perceived to be 'dysfunctional' and needs to be re-engineered. A related issue is that of H&S measurement, namely the focus on trailing or outcome indicators such as the DIIR as opposed to leading or performance indicators such as the percentage of a workforce that has received H&S training. This leads to the conclusion that the construction industry is reactive and in essence does not know how to manage H&S. FEMA, on the other hand, has historically committed resources which manifests itself in the funding of H&S Advisors and the provision of statistics.

Stakeholder contributions to construction H&S are varied. Employer associations, namely the MBSA, the respective MBAs and SAFCEC have contributed the most to H&S. Employee associations such as BCAWU, NUMSA and others have contributed sporadically to H&S and then only on high profile projects, which indicate that H&S is not a value as far as construction is concerned. No professional association has championed the discipline of construction H&S on a sustained basis until the recent establishment of ACHASM and this lack of championing has contributed to the lack of professionalism in terms of construction H&S.

Generally, with the exception of the Engineering Council of South Africa (ECSA), a lack of evidence suggests that the South African Built Environment Councils established in terms of the Council for the Built Environment Act are not contributing to H&S. Tertiary built environment education does not adequately address construction H&S, the net result being that built environment practitioners are not aware of their role therein and neither are they empowered to contribute thereto. This in turn indicates a lack of leadership, commitment and ultimately knowledge of the holistic nature of construction. Furthermore, the CETA has not influenced the course of construction H&S training and skills development.

Project managers contribute more than clients, designers and quantity surveyors, and in terms of innovation, plant and equipment manufacturers and suppliers exceed materials manufacturers and suppliers. Local authorities are making a limited contribution.

The media have contributed to H&S and not just in terms of sensationalist reporting, which indicates a level of awareness relative to H&S. The ILO and CIB have contributed substantially to H&S and their contributions can be attributed to the profile of H&S internationally and the leadership of the respective organisations.

In terms of potential contributions, with the exception of plant and equipment manufacturers, employer associations and FEMA, all stakeholders can contribute more to H&S, in particular, clients, designers, quantity surveyors, material manufacturers, tertiary institutions, local authorities, CETA, professional associations and councils.

The role of clients is particularly important and can be instrumental in enhancing construction H&S. Not only do clients have a direct interest in having the CoA reduced but enhancing H&S performance has been shown to enhance overall quality and client value. Government clients in particular have a leadership role to play in improving construction H&S, as well as a developmental role. However, the high rate of non-compliance with H&S requirements in construction indicates a low level of client leadership.

In addition to compliance with the Construction Regulations, clients can enhance H&S performance of contractors, amongst others, through the following:

- selecting contractors based on construction H&S practices and procedures;
- requiring bills of quantities to include itemised provisions for H&S; and
- specifying requirements for project-specific H&S management plans.

Several programmes and initiatives have been used locally and internationally to support performance improvement in construction H&S, including:

- adoption of certification, accreditation and assessment of H&S Management Systems;
- adoption of H&S grading and rating systems;
- adoption of H&S skills assessment schemes; and
- participation in H&S recognition schemes.

National H&S targets have been used successfully in many countries to drive performance improvement and these have generally been supported by annual measurements of H&S Key Performance Indicators (KPIs). These KPIs have also laid the foundation for benchmarking by companies.

Many dedicated H&S agencies exist around the world with a mandate to:

- regulation, inspection, investigation and enforcement; and/or
- promotion, awareness, information and advice, and promotion of research.

While the DoL Inspectorate is mandated with the former, there is currently no effective agency dealing with the latter at a national level in South Africa.

An important component of raising awareness and promoting construction H&S that is typically used by H&S agencies is that of H&S awareness campaigns. To date, construction H&S awareness has not featured in any national campaigns - including as a component of the National Construction Week.

Internationally, there is a wealth of information and best practice guidelines that construction H&S practitioners can access. However, notwithstanding the information sources that are available locally from the MBAs, SAFCEC and others, in comparison with overseas there is a paucity of information available in South Africa.

R&D is fundamental to underpin performance improvement and there are many programmes internationally that support construction H&S. However, there is currently no national R&D agenda focusing on construction H&S or targeted R&D funding stream although this is receiving attention by the cidb.

RECOMMENDATIONS

The recommendations that arise from this study of the status of construction H&S and the overall imperative of improving construction H&S in South Africa can be grouped as follows:

i) Construction Regulations: Enhancing the impact of the Construction Regulations must primarily be around monitoring, inspection and enforcement, which will require the DoL Inspectorate to be re-engineered. The current initiatives within the DoL to strengthen the Inspectorate are acknowledged and endorsed in this report.

The Regulations are also currently under review and it is recommended that relevant findings and conclusions of this status report that are currently not under consideration by the Review Committee are submitted for consideration.

Furthermore, it is recommended that guidelines are developed, including examples, to address the pervasive misunderstanding and confusion relative to, for example, the H&S Specification; the H&S File; and H&S Method Statements and Phases.

ii) Public Sector Procurement: As in many countries around the world, it is recommended that public sector clients should use their procurement potential to achieve improvements in construction H&S which would ultimately also achieve reductions in the cost of public sector infrastructure. Key elements of this strategy are that public sector clients should:

- prequalify and/or select contractors with recognised H&S skills and competencies;
- prequalify and/or select contractors with recognised H&S Management System abilities applicable to the project risk;
- specify requirements for H&S Management Plans on construction projects (and which are supportive of the Construction Regulations);
- specify requirements for H&S Management Systems and Plans from designers employed by public sector clients; and
- require the completion of assessment reports of contractors upon project completion (which includes H&S performance and verification of H&S awareness of all site workers) and that this information will be made freely available and will be used in selecting contractors during tender evaluation.

These elements of the strategy are in fact already included in the framework developed for the cidb Best Practice Project Assessment Scheme and the cidb Best Practice Contractor Recognition Scheme; elements of which are already being developed with industry input.

In addition:

- the cidb Standard for Uniformity in Construction Procurement (which is mandatory in the public sector) will be revised to include specific reference to construction H&S in standard conditions of contract; and
- the cidb will facilitate the inclusion of financial provision for H&S in the Standard Method of Measurement for Building Works and for Civil Engineering Works, and will facilitate that this is adopted in Bills of Quantities on all public sector contracts.

Furthermore, the cidb will promote all of the above to be adopted for private sector contracts.

iii) H&S Statistics and Indicators: It is important to enhance the understanding of the status of construction H&S in South Africa which requires timeous information and statistics. Specifically, it is recommended that the Compensation Commission must urgently attend to make statistics for the previous year available at the end of the first quarter of the following year. Such information should include the fatality rate, Disabling Injury Incidence Rate (DIIR), Medical Aid Incidence Rate (MAIR), Severity Rate (SR), together with agency, cause, type and anatomic region of the injury. Furthermore, the cidb contractor grading (where applicable) needs to be recorded.

The cidb's Construction Industry Indicators (CIIs) should also be expanded to include headline H&S indicators, which could be captured from the cidb project contractor performance reports. The cidb should also facilitate benchmarking initiatives, including H&S.

iv) Competence Standards for Client-appointed Agents. Minimum competence standards and accreditation needs to be established for client-appointed H&S agents in terms of the Construction Regulations.

v) 'H&S Agency': The cidb should facilitate the establishment of a focus point for the promotion; awareness; information and advice; and promotion of research. In line with its mandate, this could be a cidb function that is undertaken in partnership with DoL and industry. Key activities of this would be:

- general promotion and awareness of construction H&S;
- establishing and/or promoting relevant construction H&S grading, rating and/or recognition schemes;
- facilitating H&S awareness campaigns - ideally as part of the National Construction Week;
- facilitating the development of relevant H&S best-practice guides and information;
- promoting the 'respect for people campaign'; and
- establishing and funding construction H&S research within a national R&D agenda and the establishment of an H&S Centre of Excellence for construction H&S research.

vi) Partnering for worker involvement: The cidb should support the building H&S capacity within relevant unions and facilitate closer working relationships between employers and union members to enhance construction H&S through raising awareness of H&S, H&S training, and establishing forums with the management of contracting organisations.

vii) H&S in Tertiary Education: It is recommended that the built environment professional associations and councils should ensure that tertiary education addresses construction H&S and related issues, and they must ensure that H&S is included in CPD.

viii) Small and Emerging Contractors: Most importantly, improving construction H&S must reach out to small and emerging contractors, and must be integral to the National Contractor Development Programme (NCDP). Specifically, the cidb will investigate requirements for H&S project training on all public sector projects.

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Tel: +27 (0) 12 482 7200 **Fax:** +27 (0) 12 349 8986

Email: cidb@cidb.org.za **Website:** www.cidb.org.za

Helpline: 0860 103 353