

**4<sup>TH</sup> PROJECT AND CONSTRUCTION MANAGEMENT PROFESSIONS  
CONFERENCE**

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**THE REALITIES OF CONSTRUCTION HEALTH AND SAFETY**

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## Introduction (1)

- According to the Construction Industry Development (cidb) (2009), during visits to 1 415 construction sites by Department of Labour (DoL) inspectors:
  - 1 388 notices were issued:
    - 86 (6%) improvement notices
    - 1 015 (73%) contravention notices
    - 287 (21%) prohibition notices
  - Furthermore, **52.5% of contractors were non-compliant (Reality)**
- The disabling injury frequency rate (**DIIR**) is a rate, per 200 000 hours worked, of disabling injuries due to all causes i.e. per 100 workers x 2 000 hrs / yr:
  - **0.98** (cidb, 2009) (**Reality**)
- **Fatality rate per 100 000 workers: 25.5** (cidb, 2009) (**Reality**)

## Introduction (2)

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- **The level of non-compliance engenders the questions:**
  - **‘Why do some contractors not comply?’**
  - **‘Why do some contractors comply?’**
  - **‘Why do some contractors optimise performance?’**
- **To this end a ‘Motivators for Addressing Construction Health and Safety (H&S)’ was conducted to determine:**
  - **The reasons why contractors address construction H&S**
  - **Their progression relative thereto**
  - **Whether it is an evolutionary process or not**

## Best practice (1)



Greenacres Shopping Centre, Port Elizabeth (Smallwood, May 2016)

## Best practice (2)



Apartments, Beach Road, Mouille Point, Cape Town (Smallwood, March 2015) 5

## Best practice (3)



Office Block, Foreshore, Cape Town (Smallwood, March 2015)

## 'Failure of management' versus 'Accident'(1)

- **There is no such thing as an 'accident' (Myth)!**
- Traditional definitions include, among other: 'An unplanned event'
- **Are 'accidents' unplanned?**
  - **Absolutely not!**
  - Any review will indicate that they are **meticulously planned by default**  
**i.e. through actions and or omissions**
- **Consequently, given that the five functions of management work are planning, organising, leading, controlling, and coordinating, then unplanned events such as 'accidents' = 'failure of management' (Reality)**
- **Philosophy and constitutes a state of mind**

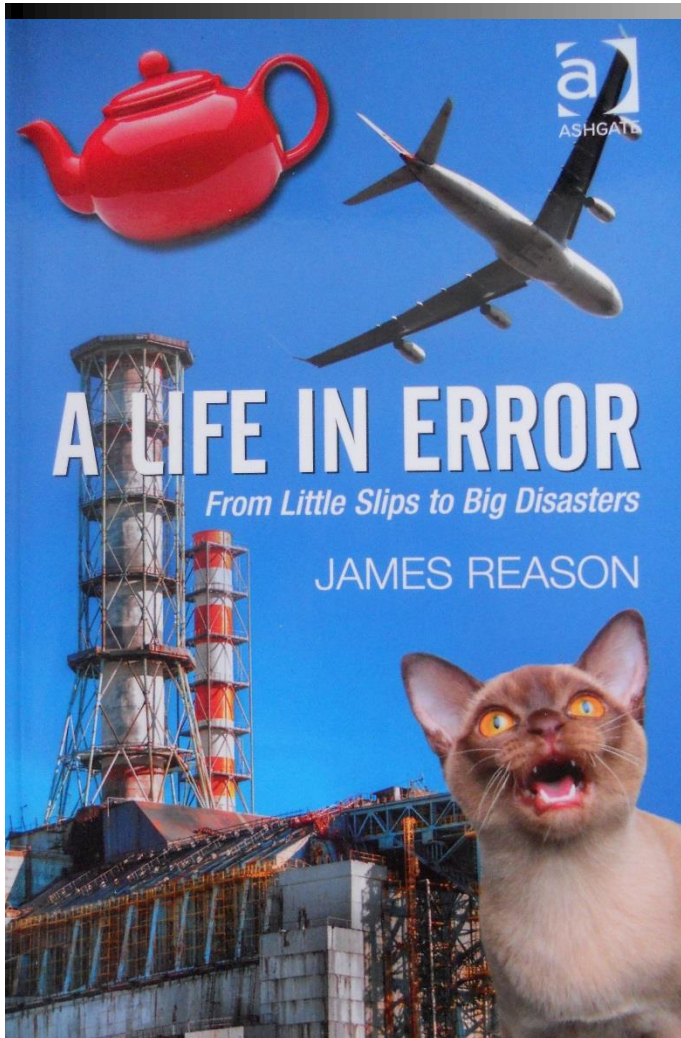
## **‘Failure of management’ versus ‘Accident’(2)**

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- **Management of all built environment stakeholder organisations, including client, project manager, designer, and quantity surveyor, not just contractors**

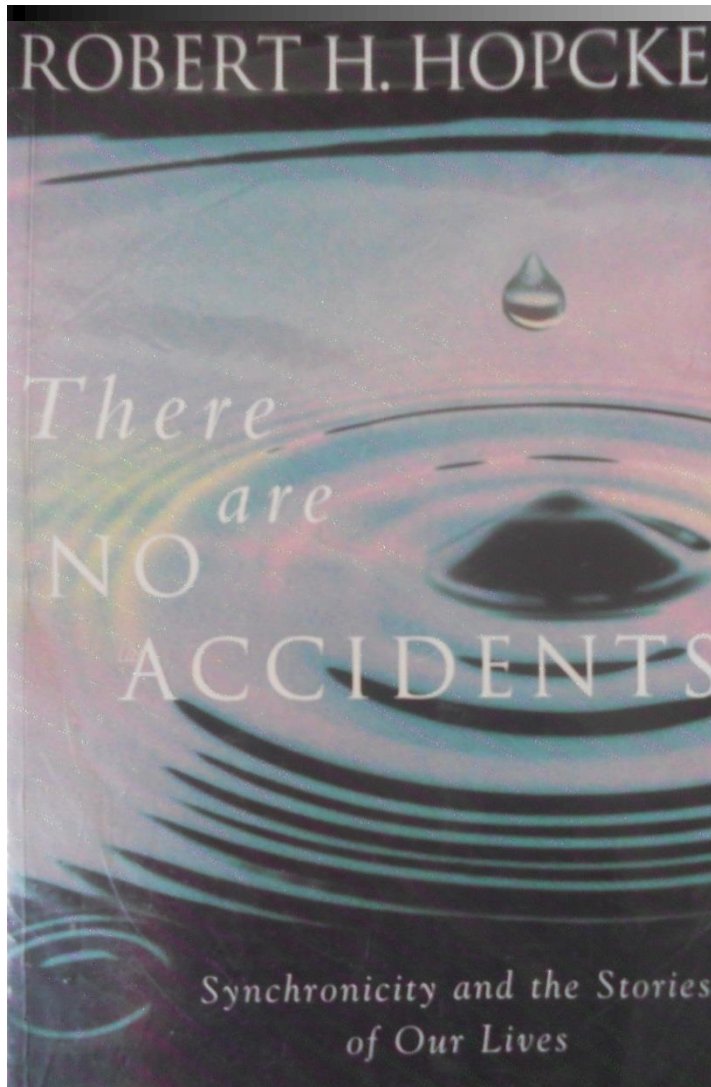


## 'Failure of management' versus 'Accident'(3)



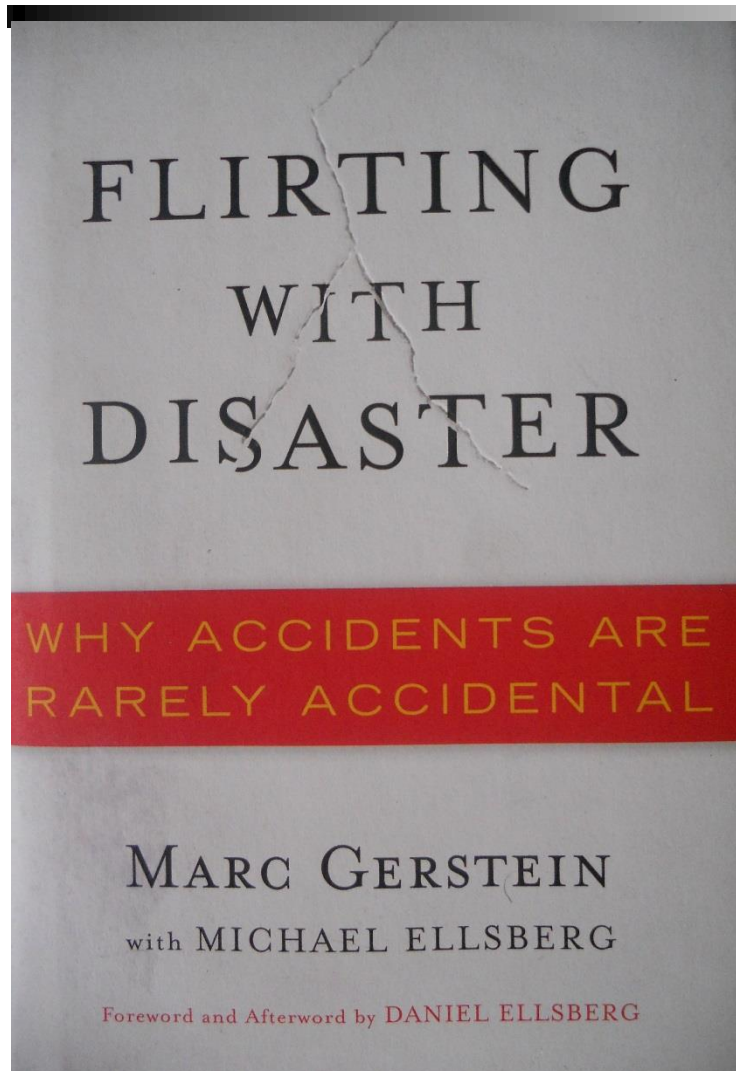
### Chapter 8: Planning Failures

## 'Failure of management' versus 'Accident'(4)



**A different kind of coincidence, a confluence of events that shakes us up. Can see and feel a significance in the randomness. Like pure chance, or just a coincidence. However, Jung refers to it as synchronicity. (p. 3)**

## 'Failure of management' versus 'Accident'(5)



## Flirting with disaster (1)



**Stellenbosch Collapse (Anonymous, June 2008)**

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## Flirting with disaster (2)



Stellenbosch Collapse (Anonymous, June 2008)

## Flirting with disaster (3)



**Stellenbosch Collapse (Anonymous, June 2008)**

## Importance of the project parameters

- Traditional project parameters of **cost, quality, and time, take precedence over H&S** in terms of the importance of project parameters (**Reality**)
- An 'image of contractors' study (Smallwood, 2010):
  - 26 image related aspects
  - The mean scores below (between 1.00 and 5.00): Ranking
  - Client related responses:
    - **Quality** (4.75) and **remaining within budget** (4.75): **1<sup>st</sup> =**
    - **Time** performance (4.25): **8<sup>th</sup>**
    - **Health** (4.00): **11<sup>th</sup>**
    - **Safety** (3.75): **13<sup>th</sup>**

## Cost of Accidents (CoA)

- **Can be related to by all stakeholders** as it can be expressed as a percentage of organisation business volume or value of construction (**Reality**)
- **Direct costs** tend to be those associated with the treatment of injuries and any unique compensation offered to workers
- **Indirect costs** include reduced productivity for both the returned worker(s) and the team, 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
- **Direct costs are covered by workers' compensation** insurance, but **indirect costs are borne by contractors** (Hinze, 2006)



## Economics of Health and Safety (1)

- **COA is estimated to be between 4.3% and 5.4% of the value of completed construction (Reality)**
- **Cost of implementing H&S is estimated to be :**
  - **Between 0.5% and 3% of project costs (Smallwood, 2004)**
  - **1.6% of tender cost estimate and 1% of project cost (Smallwood, 2011)**
- **Benefits of accident prevention outweigh the costs of accident prevention by a ratio of approximately 3:1 (Ikpe, Hammond, Proverbs, and Oloke, 2011)**
- **Clearly a financial motivation for addressing H&S**
- **'H&S is a profit centre' (Reality)**

## Economics of Health and Safety (2)

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- However, the **synergy between construction H&S and the other eleven project parameters** (Smallwood, 2006) results in further financial benefits: environment; cost; developmental criteria; environment; productivity; public H&S; quality; time; client satisfaction; design team satisfaction, and worker satisfaction

## Values (1)

Zwetsloot, van Scheppingen, Bos, Dijkman, and Starren (2013):

- **29 values and value-related factors** as supportive to H&S
- Clustered around **seven core values**
- **Seven core values** grouped into **three value clusters**
- **Positive attitude toward people and their ‘being’** characterises the **first value cluster** and is comprised of the **core values of interconnectedness, participation, and trust**
- The **second value cluster** is relevant for the **organisational and individual ‘doing’**, for actions planned or undertaken, and comprises **justice and responsibility**

## Values (2)

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- The **alignment of personal and organisational development** characterises the **third value cluster** and is relevant for **'becoming'**, and is comprised of the **values of growth and resilience**

## Marketing, Public Relations, and Image

- TQM related H&S phenomena, which contributed to the acquisition of work, indicate the indirect role and benefits of optimum H&S in construction marketing (Smallwood, 2005)
  - Optimum H&S provides 'better practice' H&S GCs with a competitive edge, and increases their attractiveness to clients
- The 'image of contractors' study indicated the importance of H&S (de-linked)
- Majority of construction sector firms view H&S performance to be important in terms of commercial success due to its impact on tendering and their reputation [Brabazon et al. (2000) in Wright and Marsden (2002)]
- Clearly, performance relative to H&S affects clients' perceptions of a contractor's image, which in turn impacts on their reputation

## Research – Sample stratum

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- **14 Members of the East Cape Master Builders Association (ECMBA) who achieved places in the 2013 Regional H&S Competition**
- **Selected on the basis of:**
  - **Commitment to H&S**
  - **Achievement of a recognised standard of H&S performance**
  - **Consequently deemed to be knowledgeable with respect to the process of H&S improvement**
- **Response - 9 Responses were received, which equates to a 64.3 % response rate**

# Research – Findings (1)

Parameter	Response (%)						MS	Rank
	U	Not ..... Very						
		1	2	3	4	5		
Cost	0.0	0.0	0.0	0.0	0.0	100.0	5.00	1
Schedule (Time)	0.0	0.0	0.0	0.0	11.1	88.9	4.89	2
Quality	0.0	0.0	0.0	0.0	22.2	77.8	4.78	3
Productivity	0.0	0.0	0.0	0.0	33.3	66.7	4.67	4
H&S	0.0	0.0	0.0	22.2	22.2	55.6	4.33	5
Environment	0.0	0.0	11.1	44.4	11.1	33.3	3.67	6

Table 1: Importance of project parameters to respondents’ organisations (MS: 1.00 – 5.00).

## Research – Findings (2)

'Motivator'	Response (%)							MS	Rank
	Un- sure	Did not	Minor..... Major						
			1	2	3	4	5		
OH&S Act	11.1	0.0	0.0	0.0	11.1	0.0	77.8	4.75	1
Image	0.0	0.0	0.0	0.0	0.0	55.6	44.4	4.44	2
Construction Regulations (H&S)	0.0	0.0	0.0	0.0	11.1	33.3	55.6	4.44	3
Professionalism	0.0	0.0	0.0	0.0	0.0	66.7	33.3	4.33	4
Reputation	0.0	0.0	0.0	0.0	0.0	77.8	22.2	4.22	5
H&S is an organisation value	0.0	0.0	0.0	11.1	0.0	44.4	44.4	4.22	6
H&S is a moral issue	0.0	0.0	0.0	0.0	11.1	66.7	22.2	4.11	7
+ Impact of optimum H&S on environment	0.0	0.0	0.0	0.0	33.3	22.2	44.4	4.11	8
Organisation H&S policy	0.0	0.0	0.0	11.1	11.1	33.3	44.4	4.11	9
+ Impact of optimum H&S on cost	0.0	0.0	0.0	0.0	33.3	33.3	33.3	4.00	10
+ Impact of optimum H&S on profitability	0.0	0.0	0.0	0.0	33.3	33.3	33.3	4.00	11
+ Impact of optimum H&S on schedule	0.0	0.0	0.0	0.0	33.3	33.3	33.3	4.00	12
Preservation of organisational integrity	0.0	0.0	0.0	11.1	11.1	44.4	33.3	4.00	13
COID Act	0.0	0.0	0.0	11.1	22.2	22.2	44.4	4.00	14
National Constitution	11.1	0.0	0.0	0.0	44.4	0.0	44.4	4.00	15

**Table 2A: Extent to which 'motivators' contributed to respondents' organisations addressing H&S (MS: 0.00 – 5.00).**



## Research – Findings (3)

'Motivator'	Response (%)							MS	Rank
	Un-sure	Did not	Minor..... Major						
			1	2	3	4	5		
Construction Management issue	0.0	0.0	11.1	0.0	11.1	33.3	44.4	4.00	16
+ Impact of optimum H&S on productivity	0.0	0.0	0.0	0.0	37.5	25.0	37.5	4.00	17
Marketing edge / advantage	0.0	0.0	11.1	0.0	11.1	33.3	44.4	4.00	18
H&S specification	0.0	0.0	0.0	0.0	33.3	44.4	22.2	3.89	19
+ Impact of optimum H&S on quality	0.0	0.0	0.0	0.0	33.3	44.4	22.2	3.89	20
Impact of poor H&S on productivity	0.0	0.0	0.0	0.0	44.4	22.2	33.3	3.89	21
DoL enforcement of legislation & regulations	22.2	0.0	0.0	11.1	22.2	11.1	33.3	3.86	22
Resulting client satisfaction	0.0	0.0	0.0	11.1	22.2	44.4	22.2	3.78	23
Corporate social responsibility issue	0.0	0.0	0.0	22.2	0.0	55.6	22.2	3.78	24
Impact of poor H&S on cost	0.0	0.0	0.0	11.1	33.3	22.2	33.3	3.78	25
Impact of poor H&S on profitability	0.0	0.0	0.0	11.1	33.3	22.2	33.3	3.78	26
Impact of poor H&S on schedule	0.0	0.0	0.0	11.1	33.3	22.2	33.3	3.78	27
Other Regulations	12.5	0.0	0.0	12.5	25.0	25.0	25.0	3.71	28
Resulting worker satisfaction	0.0	0.0	0.0	0.0	44.4	44.4	11.1	3.67	29
Impact of poor H&S on quality	0.0	0.0	0.0	11.1	33.3	33.3	22.2	3.67	30

Table 2B: Extent to which 'motivators' contributed to respondents' organisations addressing H&S (MS: 0.00 – 5.00).

## Research – Findings (4)

'Motivator'	Response (%)							MS	Rank
	Un- sure	Did not	Minor..... Major						
			1	2	3	4	5		
Impact of poor H&S on environment	0.0	0.0	0.0	22.2	22.2	22.2	33.3	3.67	31
Resulting designer satisfaction	0.0	0.0	0.0	11.1	33.3	44.4	11.1	3.56	32
'I am my brother's / sister's keeper'	0.0	0.0	0.0	22.2	11.1	55.6	11.1	3.56	33
Detailed inclusion of H&S in contract documents	0.0	0.0	11.1	11.1	11.1	55.6	11.1	3.44	34
Client 'pressure'	0.0	0.0	11.1	11.1	22.2	33.3	22.2	3.44	35
Client requirements	0.0	0.0	11.1	0.0	44.4	33.3	11.1	3.33	36
Cost of accidents	0.0	0.0	11.1	11.1	44.4	0.0	33.3	3.33	37
Economic benefits of H&S	0.0	11.1	0.0	11.1	11.1	55.6	11.1	3.33	38
Employer association guidance	22.2	0.0	0.0	11.1	44.4	22.2	0.0	3.14	39
Cost of compensation insurance	0.0	0.0	11.1	0.0	66.7	11.1	11.1	3.11	40
H&S Preliminaries in the BoQ	0.0	11.1	11.1	11.1	33.3	22.2	11.1	2.78	41
Worker 'pressure'	0.0	0.0	33.3	22.2	22.2	11.1	11.1	2.44	42
Compensation insurance provider 'pressure'	0.0	11.1	11.1	33.3	33.3	11.1	0.0	2.22	43
Union 'pressure'	0.0	0.0	55.6	11.1	22.2	0.0	11.1	2.00	44

Table 2C: Extent to which 'motivators' contributed to respondents' organisations addressing H&S (MS: 0.00 – 5.00).

## Research – Findings (5)

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- **Anglo American plc (2014), the giant South African mining group**
- **The lost-time injury frequency rate (LTIFR) is a rate, per 200 000 hours worked, of employee and contractor lost-time injuries due to all causes i.e. per 100 workers x 2 000 hrs / yr**
- **Their rate reduced from 0.58 in 2012 to 0.49 in 2013**
- **Average LTIFR for the South African construction industry is 0.98 [Construction Industry Development Board (cidb), 2009]**
- **Anglo American plc's safety journey model used as depicted in Figure 1 (Slide 16)**

# Research – Findings (5)

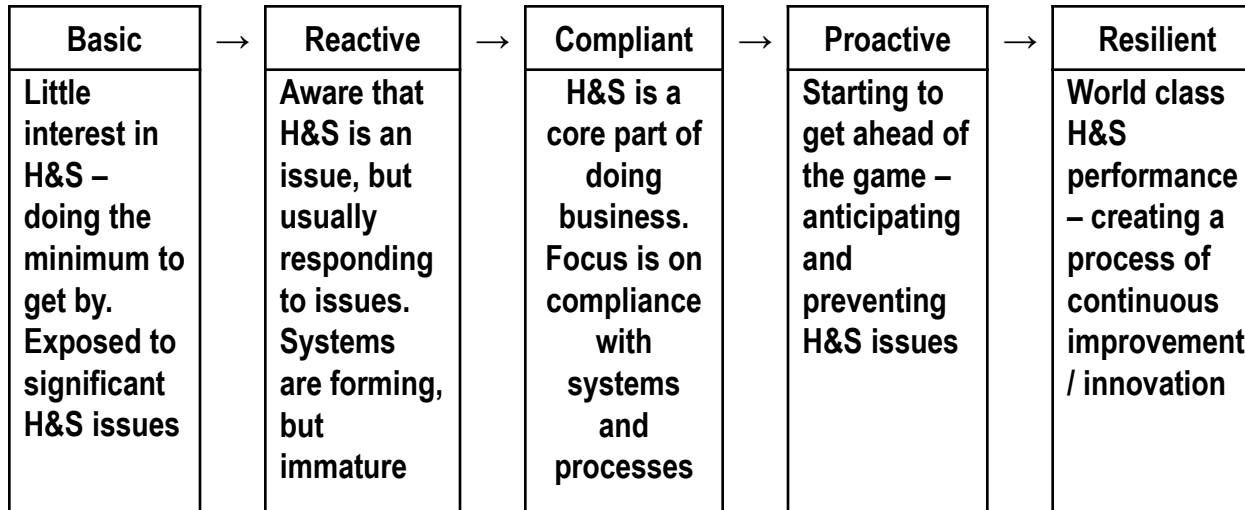


Figure 1: Anglo American plc’s H&S Journey Model

## Research – Findings (6)

Response (%)					Mean Score
SD	D	N	A	SA	
0.0	0.0	11.2	44.4	44.4	4.33

**Table 3: Extent to which respondents agree the model represents their organisation's H&S development (MS: 1.00 – 5.00).**

Response (%)					Mean Score
Basic	Reactive	Compliant	Proactive	Resilient	
0.0	12.5	25.0	25.0	37.5	3.88

**Table 4: Respondents' organisations' current H&S status (MS: 1.00 – 5.00).**

## Research – Findings (7)

Statement	Response (%)					MS
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
The positive impact of optimum H&S on overall performance promotes increased focus on H&S	0.0	0.0	11.1	66.7	22.2	4.11
Improving H&S performance is progressive	0.0	0.0	0.0	88.9	11.1	4.11
The journey to optimum H&S is progressive	0.0	0.0	11.1	66.7	22.2	4.11
Fatalities promote increased focus on H&S	11.1	11.1	0.0	22.2	55.6	4.00
Incidents promote increased focus on H&S	0.0	0.0	11.1	88.9	0.0	3.89
Organisations initially address H&S due to legislation	0.0	11.1	0.0	88.9	0.0	3.78
Accidents promote increased focus on H&S	0.0	11.1	0.0	88.9	0.0	3.78
Disabling injuries promote increased focus on H&S	0.0	22.2	0.0	66.7	11.1	3.67
Employer associations promote focus on H&S	11.1	0.0	11.1	77.8	0.0	3.56
The uninsured costs of accidents promote increased focus on H&S	0.0	22.2	22.2	44.4	11.1	3.44
The negative impact of poor H&S on overall performance promotes increased focus on H&S	0.0	11.1	33.3	55.6	0.0	3.44
The insured costs of accidents promote increased focus on H&S	0.0	22.2	33.3	33.3	11.1	3.33
The DoL Inspectorate promotes focus on H&S	0.0	22.2	33.3	44.4	0.0	3.22
Clients promote focus on H&S	22.2	11.1	22.2	33.3	11.1	3.00

**Table 5: Degree of concurrence with statements on a range of strongly disagree to strongly agree (MS: 1.00 – 5.00).**

## Research summary (1)

**Extent to which 'motivators' contributed to respondents' organisations addressing H&S:**

- **6 / 44 (13.6%) between a near major to major / major extent (MSs > 4.17 ≤ 5.00):**
  - OH&S Act
  - Image
  - Construction Regulations (H&S)
  - Professionalism
  - Reputation
  - H&S is an organisation value
- **29 / 44 (65.9%) between some extent to a near major / near major extent (MSs > 3.34 ≤ 4.17)**
- **6 / 44 (13.6%) between a near minor extent to some extent / some extent (MSs > 2.51 ≤ 3.34)**

## Research summary (2)

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- **3 / 44 (6.8%) between a minor extent to near minor / near minor extent (MSs  $> 1.68 \leq 2.51$ )**



## Conclusions (1)

- **Cost, schedule, quality, and productivity are ranked higher than H&S in terms of importance:**
  - **Concluded that GCs are likely to view the traditional project parameters as more important than H&S for the foreseeable future**
  - **Amplifies the need to motivate H&S on the basis of the positive impact optimum H&S has on overall performance**
- **Extent to which ‘motivators’ contributed to respondents’ organisations addressing H&S - conclusions:**
  - **Ranking of the OH&S Act and Construction Regulations - legislation constitutes a primary motivator**
  - **Ranking of image, and professionalism - there is understanding and appreciation of the holistic role of H&S**
  - **Ranking of H&S is an organisation value, and H&S is a moral issue- although legislation is important, H&S is a moral issue (reinforced by the high ranking of preservation of organisational integrity)**

## Conclusions (2)

- Positive impact optimum H&S has on performance relative to the other project parameters - GCs are aware of the synergistic effect of optimum H&S (reinforced by the ranking of marketing edge / advantage)
- Respondents' agreement that their organisation's H&S development had followed the presented model 'Basic → Reactive → Compliant → Proactive → Resilient' - H&S development and performance is stage based and evolutionary
  - Unless the prior stages are completed, progression will not occur
  - Premature motivation on the basis of the benefits that accrue at the next level is necessary to engender such progression
- Implications for those promoting H&S:
  - Particularly when endeavouring to engender progression to the proactive and resilient stages
  - To reach the resilient stage will require a holistic approach to promoting H&S, and increased focus on and commitment of resources to H&S

## Recommendations

- **A multi-faceted approach should be adopted when promoting H&S - this applies to the DoL Inspectorate, employer associations, employee associations, construction managers, and H&S consultants:**
  - Obviously legislation should be cited and referred to
  - However, the moral rationale for addressing H&S should feature prominently in tandem with the upholding of reputation and image, and consequent marketing benefits
  - Then, the synergistic benefits of H&S should always be cited
- **However, in order to realise self-reinforcement of the promotion of H&S on the aforementioned basis, on-going research relative to the benefits of H&S must be conducted**

## Realities

- The industry is killing and injuring people (also making them ill)
- H&S non-compliance occurs = contravention
- Non-compliance is unethical
- Accidents are ‘failures of management’
- Cost, quality, and time, take precedence over H&S
- CoA > CoP
- Synergy between the catalyst H&S and the other parameters
- There is a return on investing in H&S
- Improving H&S and achieving optimum H&S is a journey i.e. a progressive process
- Optimum H&S performance enhances a firm’s reputation, image, and likelihood of securing projects
- A holistic approach to promoting H&S is required

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