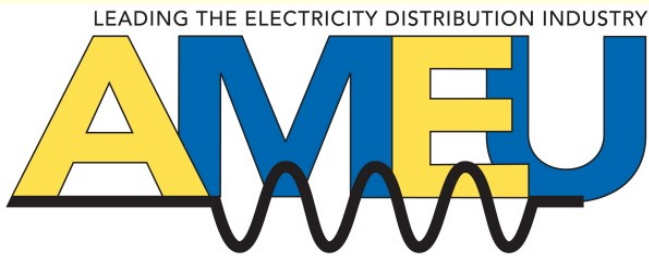


THE ROLE OF HUMAN RISK TAKING BEHAVIOUR AND THE INFLUENCE OF LEGISLATIVE STANDARDS ON ELECTRICAL INCIDENTS

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Introduction

The electrical engineering H&S environment

- **The current H&S approach:**
 - Base on compliance with safety and organisational standards
 - No cognisance given to human risk behaviour component
 - Engineering management view
- **Legislative compliance:**
 - To be managed by safety officers or consultants
 - Engineering competence
 - Contravention of specific regulations

Risk Behaviour

- Risk behaviour

Influence by individuals perception of risk:

- Affected by physical and mental capabilities
- Environmental influences due to systems and equipment
- Characteristics of organisation

- Ability of electrical workers to judge risk:

in relation to a specific task, is influence by the

- Individuals perception of risk
- Accepting or rejecting risk related to such specific task

Perception of Risk

- Perception of risk
 - Factors includes: psychology, sociology, and the anthropology of humans
 - Relates to both the external, socio environment as well as the individual's beliefs as influence by a cultural impact
 - People adjust their risk taking behaviour towards their target level of perceived risk. This means that people will behave more cautiously and accept fewer risks when they feel threatened and conversely, they will behave more daringly and accept higher levels of risk when they feel safe and secure



Severity of risk

Severity of risk factors

- Severity of risk factors are determined by experience from the field in an interactive environment. The experience of risk therefore is not only an experience of the physical properties of the situation, but also a process of learning and understanding the potential of specific aspects of the risk environment (Dey, 2001)



The electrical environment

- The field of electrical work:
 - Building construction industry
 - Transmission and distribution reticulation networks
- Incidents in the electrical industry:
 - Not only negligence or wilful non compliance
 - Gains for individual and the organisation
- Risk taking behaviour in the electrical industry:
 - Actions of individuals due to their perception of danger
 - Avoiding due to forced compliance if no risk is perceived

Unique traits

- **Unique traits**

Ability to judge risk in the electrical construction industry:

- Education rather than heuristic learning
- Human sensory detection
- Exposure to live electrical installations

- **Government control:**

- Control and police
- Registration and regulating level of competency

H&S in the electrical maintenance industry

- Primary SA engineering challenge

(Hall and Sandelands, 2009): development of basic skills, professional leadership and the protection of experience in South Africa

- Unique challenges

The South African electrical environment is faced with unique challenges

- Skill shortages
- Expanding economy
- Historical past of low technical exposure
- Government department capacity shortages (Non compliance with legislative standards)
- Culture diversity

The impact of culture on risk perception

- Unique cultural and history of S.A:
 - Large portion of population were not previously exposed to technology
- Culture (Perez and Gonzalez, 2007):
 - The study of culture could facilitate understanding as to when and why people behave in a safe manner at work.
 - Cultural values affect the way in which people think and behave when faced with a safety-related issue
- Culture Norms (Weber and Hsee, 1998):
 - Cultural norms can have a direct influence on the individual's perception of risk and to what extent risk will be taken

Research – methodology

- Objectives of the study –

Surveys were conducted to determine the perceptions of risk from members of electrical engineering institutes and contracting organisations involved in the electrical maintenance and construction industry, regarding the:

- Importance of various project parameters
- Manifestation of the impact of risk behaviour, influenced by workers perception of risk
- The effect of risk taking behaviour on H&S management systems

Research – methodology

Measure	ICMEE	ECA	MUN	SAIEE	Mean
Analysed (No.)	12	11	8	8	9.75
Sample stratum (No.)	145	450	30	64	689
Response rate (%)	8.3	2.4	19	12.5	10.7

Table1: Response rates for the sample strata.

Research – Findings (1)

Parameter	ICMEE		ECA		MUN		SAIIE		Mean	
	Mean score	Rank	Mean score	Rank	Mean score	Rank	Mean score	Rank	Mean score	Rank
Cultural Impact	4.22	1	4.13	1	2.50	4	3.00	4	3.48	1
Perception of hazards	3.39	2	3.50	2	3.30	1	3.25	1	3.39	2
Motivational incentives	2.83	3	3.19	3	2.83	5	3.00	4	2.96	3
Management influence	2.61	4	2.25	5	2.93	3	3.13	2	2.73	4
Role of H&S legislation	2.44	5	2.58	4	3.70	2	2.00	5	2.60	5

Table 2: Degree of importance of various parameters to respondents' organizations.

Research – Findings (2)

Aspect	ICMEE		ECA		MUN		SAIEE		Mean	
	Mean score	Rank	Mean score	Rank	Mean score	Rank	Mean score	Rank	Mean score	Rank
Training can alter risk taking behaviour of electrical workers	4.44	1	4.25	1	3.50	2	5.00	1	4.55	1
Electrical workers will perceive hazards differently	3.78	3	4.00	3	3.00	3=	4.00	3	3.88	2
Existence of different cultures perception of risk	4.22	2	4.13	2	2.50	4=	3.00	5=	3.56	3
The influence of safety standards on risk perception	3.00	6	3.00	6=	4.50	1	3.00	5=	3.16	4
Electrical accidents are relates to management incompetence	3.11	5	2.25	10=	2.25	5=	3.50	4	3.09	5
Management competency is related to risk taking behaviour	3.56	4	3.00	6=	3.00	3=	1.50	12=	2.98	6
The framework of legislation, prevents risk taking behaviour	2.67	8=	2.75	8=	2.50	9	2.50	9	2.92	7
Safe work procedures differ among electrical construction workers	3.00	6	3.50	4	1.50	7	1.50	12=	2.81	8

Table 3: Manifestation of the impact of risk perception in the electrical construction industry (a near minor impact to impact / impact) .

Research – Findings (3)

Aspect	ICMEE		ECA		MUN		SAIIE		Mean	
	Mean score	Rank	Mean score	Rank	Mean score	Rank	Mean score	Rank	Mean score	Rank
Financially gain or other advances results in unsafe behaviour	2.67	8=	3.38	5	2.00	13	3.00	5=	2.76	9
Management training is not the solution to risk taking behaviour	2.00	12=	1.75	14	2.50	11	4.50	2	2.69	10
Better government policing will prevent risk taking behaviour	2.67	8=	2.75	8=	4.00	2	1.00	14	2.60	11
Health and safety legislation can alter risk perception of unsafe acts	2.00	12=	2.25	10=	1.50	7	2.50	9	2.53	12
Unsafe behaviour is the norm for electrical workers	2.33	11	2.25	10=	2.25	5	2.50	9	2.33	13
Management practises do not promote safe behaviour	1.78	14	2.00	13	1.75	6	3.00	5=	2.16	14

Table 3: Manifestation of the impact of risk perception in the electrical construction industry (a near minor impact to impact / impact) .

Conclusions and Recommendations (1)

- **C1: Training is seen as a motivational incentive that can address risk taking behavior**
- **R1.1: The electrical engineering industry needs to make a paradigm shift in terms of the status of H&S**
- **R1.2: Electrical engineering institutes and contractor associations should engender such a paradigm shift, by recommending that H&S education address competency by formal training and acquisition of practical skills**

Conclusions and Recommendations (2)

- **C2: Electrical construction workers perceive hazards differently due to their reliance on knowledge rather than human sensory detection**
- **R2 : Due to the environment of not being able to judge hazards, the use of practical training and evaluating job task for specific individual risk profiles is recommended**
- **C3: The impact of different cultures in the industry is significant especially in the South African environment, and influence risk taking behaviour**

Conclusions and Recommendations (3)

- **R3.1: The effect of different cultures should be taken into account when implementing a H&S system due to different perceptions of risk as influenced by different cultural backgrounds**
- **R3.2: Individual workers should be evaluated (simulating environment) to determine their risk profile and how to utilise such persons or allocate specific job tasks accordingly**
- **C4: Standards incorporated into H&S legislation have an influence on individual risk perception that affects risk taking behavior**

Conclusions and Recommendations (4)

- **R4: H& S standards should be seen as guidance and not a H&S management system that will guarantee reduction in incidences of loss**
- **C 5: Management competency do have an effect and influence workers risk taking behaviour**
- **R 5: H&S management systems should not only address the competency of workers but also managements competency on implementing H&S systems that will have an impact on risk taking behaviour**



If you are not taking risks you are taking a big risk

Thank You

